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D. M. Campbell, Editor A. T. Kinsley, Associate Editor

Cattle and sheep producers in Texas fed more cattle and sheep during the past season than ever before. It has been estimated that 150,000 cattle and 250,000 sheep have been fed for market this season. This feeding has been done for two reasons—the low price for breeder cattle and sheep during the fall of 1931, and the abundance of cheap feed in Texas.

According to Dr. C. W. Rees the parasite causing bovine anaplasmosis has been transmitted, in carefully controlled experiments, by the *Dermacentor variabilis*. This tick has a wide distribution in the United States and thus the widespread occurrence of bovine anaplasmosis is possible. It will be well for practitioners, in sections where these ticks abound, to keep on the lookout for anaplasmosis.

The total number of cattle slaughtered under Federal inspection in 1931 was 8,107,842. This was 63,000 fewer than in 1930. Calves slaughtered in 1931 numbered 4,716,560. This was approximately 120,000 more than were slaughtered in 1930. The increased calf slaughter is indicative of the growing demand for the smaller cuts of meat. It will ultimately result in a shortage of beef, that is it takes a greater number of cows to supply the tonnage of meat required in the form of veal than in matured beef.

Muscular tremors followed by convulsions is of common occurrence in pigs. This condition has been rather definitely determined to be due to vitamine and mineral deficiency and can be prevented by providing brood sows and pigs a ration containing ample quantities of calcium phosphate and vitamines.

It was found, in an experiment at the Pennsylvania Station, that including 0.4 per cent of tobacco in the mash of chicks up to the age of 10 weeks, would prevent infestation of round worms, even when the baby chicks that were fed ascaris eggs to the number of 15,000 per chick. Seventy-eight per cent of the control chicks, not receiving tobacco in the mash, were infested.

Systematic tuberculin testing of range cattle in the Panhandle district of Texas and other parts of the southwestern plains region is now in progress in accordance with a plan developed to meet conditions of such regions. A recent report received by the U. S. Department of Agriculture from officials in Texas shows that approximately 7,500 cattle were tested in about two weeks by four veterinarians. The new basis for accreditation requires the testing of at least 10 per cent of the cattle in any range or semi-range area. Similar testing is also progressing satisfactorily in northwestern Oklahoma and southwestern Kansas.

Verily there are rewards for doing good to dumb animals and giving them water to drink.—Koran.

At present prices of corn, barley, wheat, tankage and any supplements that may be required in the corn belt states, the feed cost per sow for six months and a litter of pigs until weaned, is not over $12.00. Thus, if six pigs are produced the feed cost per pig is $2.00 and this includes the keep of the sow for approximately six months. This cost does not include labor, equipment or interest on the investment in the sow. The marketing of feed crops via the pig route is profitable even at present hog prices.—*Poland China Journal.*

The possibility of a filterable stage or form of various bacteria has been a muted question. Recently Kendall of North Western University reports three successive filtrations of an authentic strain of *B. typhosis* that had been grown on a protein medium. Kendall's filtration experiment suggests the possibility of producing filtration forms of various bacteria by the use of special media and it suggests the possibility of converting filterable viruses into non-filterable forms.—*Science.*

MORE INVISIBLE BACTERIA THAN VISIBLE ONES IN MILK

The filterable forms of germs, which are so small that they cannot ordinarily be seen even with the most powerful miscroscopes, far outnumber their larger, microscopically visible relatives in such substances as milk and milk products, soil, hay infusions and decomposing manure, experiments by Prof. J. M. Sherman and C. E. Safford of Cornell University show.

The ordinary forms of germs may be found by the million or even billion in one gram, which is roughly one-thirtieth of an ounce, in certain types of decomposing and fermenting materials. But the investigators found not millions but trillions of the minute organisms to the gram in some samples of milk.—*Science.*

RATIONS FOR CHICKS

The Iowa Experiment Station recommends a mash ration containing 50 per cent yellow corn, 15 per cent dried buttermilk, 15 per cent bran, 15 per cent middlings, 4 per cent bone meal, and 1 per cent salt for satisfactory growth in chickens and turkeys. This ration is also satisfactory for growing ducks and geese if the bone meal content is increased to 10 per cent of the total.

Dexter is the name of the smallest breed of cattle. The Dexters are found mainly in Ireland. Two or three Dexters can be maintained on the acreage required for one cow of the larger breeds. The milk of the Dexter is above the average in butter fat. These cattle are long-lived and yield a good flow of milk for many years. Fifteen-year-old Dexter cows have been known to produce upward of 15,000 pounds of milk a year. These cattle are hardy, and thrive on rough pasture where feed is scarce. They are good beef producers. The steers fatten on grass. Tuberculosis is practically unknown in Dexter cattle. They are particularly adapted for family cows on small farms, as they are dual purpose cattle, docile and economically housed.—*Hereford Journal.*

OUSTING QUACKS IN TURKEY

The S. P. C. A. in Constantinople has presented to the government suggestions as to new laws for protection of animals. One of these was to prohibit quack veterinarians from practicing and this has been put into effect by an order from the Minister of Economy to every Vali (Governor) in Turkey.

The quacks are now being run out of business. In addition to the customary legal penalties they are compelled to reimburse the owners of horses they have ruined to the full amount of the animal's value. Many animals have been rendered useless by quack treatment and have had to be destroyed.

If the new laws requested are passed Turkey will have as good laws for protection of animals as any country in Europe. —*National Humane Review.*

In vaccination work with abortion vaccine in the control of Bang's disease, Schmidt and collaborators report in the Texas Station Report (1930) that 12.2% of the 41 cows vaccinated during the year aborted. This was approximately double the percentage that aborted during the four years previous and was only one-half the abortion rate for ten years preceding the time when vaccine was used.

Ranikhet disease is the name of an apparently new disease of fowls. It is an acute, usually nonfebrile, contagious and infectious disease caused by a filterable virus. It is characterized by dyspnea and a high mortality. Petechial hemorrhage in the submucosa of the proventriculus is practically the only lesion. This malady is probably identical to the so-called "New Castle" disease in England and "avian pest" of the Philippines.—*Exp. Stat. Rec.* 66-4.

AVOCATIONS AND HOBBIES: HAVE YOU ONE?

Some people spend their entire lives in doing the work for which they patterned themselves. Others take a holiday so to speak, now and then, and do a little out of the ordinary to rest both mind and body. Some even become authorities in the various fields of their avocations.

Cooper Curtis has found a most enjoyable hobby in the study of paleontology. Dean Mark Francis of Texas also is a recognized paleontologist and possesses an unusually fine collection of fossils. E. A. Schmoker receives compliments almost daily on his cartoons appearing in the various periodicals and trade journals. D. M. Campbell, for a number of years, was an owner and publisher of the leading golf magazine, and has played the game in two-thirds of the states of the Union and also in its native home. Horst Schreck receives mental relaxation as well as remuneration for his architectural plans for modern veterinary hospitals, made in his spare time. The late D. B. Morgan was a lapidarist of parts and spent many pleasant and profitable vacations gathering diamonds in the Ozark Mountains. D. F. Luckey spent several summers on the lecture platform for a prominent lyceum bureau.

Looking a little farther, we find that sports have a drawing power for some of the men engaged in the science of veterinary medicine. Doctor H. Brownlee is the owner of the world's fastest greyhound. Football calls for the services of F. A. Lambert and E. P. Maxwell as officials. J. F. DeVine is in frequent demand as a judge of saddle and harness classes at fashionable horse shows.

Others find enjoyment in breeding and exhibiting the various species of animals. E. J. Frick finds a diverting hobby from teaching in being vice president of the Franzhurst Rainbow Trout Company, largest producers of commercial trout in the world. N. A. McCosh is the exhibitor of many prize Plymouth Rocks at the various recognized poultry shows. W. J. Pirie has accumulated more blue ribbons for Rhode Island Reds than he is years old. Dean E. E. Wagner is an authority on the breeding of mink, being actively engaged in the work in addition to teaching. H. W. Ayers finds the breeding of Boston terriers an enjoyable pastime; he is also a recognized expert in rabbit breeding. L. W. Goss is noted for the breeding of Irish terriers, as is W. W. Lichty for wired haired fox terriers.

The veterinarians who have gone in for politics makes too long a list to tabulate. Although veterinary city councilmen, mayors and state legislators are numerous, so far as the writer knows, only one member of the profession has been elected governor of his state.

Noting such a wide range in the avocations or hobbies of these men, we should come to realize the importance of developing within ourselves the power to grasp a suitable avocation when the time arises, thus making ourselves a bigger asset to the communities in which we live.

Oliver E. Flory,
K. S. C., '32.
Manhattan, Kansas.

Summer Work for Veterinary Students

By A. F. VAN MEVEREN, Manhattan, Kansas
Kansas State College, Class of 1932

AFTER three years in a course in veterinary medicine, the junior student begins to realize he has acquired some basic knowledge of the profession. The problem then arises, how may he apply some of this knowledge before the time comes to graduate, so he may feel better prepared for his life work?

I will mention two ways he may obtain some knowledge of the practical problems of the profession, which I have learned from my own experience. They are: Working with a preceptor out in the field and employment in an anti-hog cholera serum plant. These to my mind give one fairly good cross sections of professional work.

The "tricks of the trade" which may be learned from the practitioner are:

1. The student may observe the various methods of restraint used by the veterinarian which are quite often different from those used at the college clinic, where there is equipment for all animals, large or small, and always plenty of help. To see how it is done with less equipment and less help, is a school in resourcefulness.

2. He may familiarize himself with the drugs most commonly used in the field. A practitioner in most instances limits his drugs to the most important ones, while in the college pharmacy one has access to any drug which may be mentioned.

3. The veterinarian is constantly confronted by the problem of sanitation. Very often major operations are performed in the barnyard, or in the feed lot, and probably in some dirty stable where it is impossible to place the animal on a sanitary operating table. Conditions such as these demand exceptional antiseptic precautions, and adaptability on the part of the surgeon.

4. Lastly, and probably the most important pointers the student may learn from the practitioner, are business methods. The veterinarian is the man in the community best qualified to treat diseases of live stock. And once he has convinced the people of this fact, a great deal is accomplished.

Some questions which often arise in the mind of the young men are: How much shall I charge for treatment of a certain animal? What mileage shall I charge? Or, how shall I collect a bill a client has owed me for several months? All these are very important to a man starting out in practice. By observing how one or more successful practitioners handle such problems he is able to avoid some of the ever-present pitfalls that yawn before the feet of every young practitioner.

I discovered that being employed by a hog cholera serum company is very profitable for a student. The knowledge obtained will aid anyone, no matter what line of work he may go into. First, in the postmortem room, where virus pigs are posted, nearly every disease of swine may be seen. And especially does he become acquainted with the most outstanding disease of swine—hog cholera. It is said that hog cholera constitutes 90% of the ailments of hogs. Naturally, a practitioner in a community where many hogs are raised should know this disease thoroughly. At a serum plant many pigs are inoculated every week with hog cholera virus, and therefore every stage of the disease may be studied; such as the incubation period of the virus, body temperature at different periods, the duration of the disease, and any other clinical symptoms which may be seen.

Second, the student may learn the treatment for the disease, how to prevent the disease and how to check it when already found in a herd and also under

what conditions and environment swine should be vaccinated.

Third, one may learn how swine should be fed and raised, how hog houses may be kept sanitary and well ventilated, and what antiseptics and disinfectants may be used around swine.

Lastly, one becomes acquainted with the ways and methods of the government inspection maintained by the Federal Bureau of Animal Industry.

Eight veterinary undergraduates working for an anti-hog cholera serum company—Summer 1931. Four are students in the Kansas State College and four in the Iowa State College. Front row, left to right: Messrs. Wendell, Miller, Johnson and VanMevern. Rear row, left to right: Messrs. Glenny, Johnson, Bailey and Clark. All are seniors now

In conclusion, I would urge that practitioners and biologic houses employ as many students during the summer months as they can find places for, either to do professional work or as common laborers. This will be a great aid to the next generation of veterinarians. Further, the student is acquainted with the newer methods of surgery and therapeutics and can often bring valuable new ideas and suggestions to his employer.

WOMEN IN VETERINARY MEDICINE

More than 25% of the students in the Royal Veterinary College, London, England, are women. This development, that of women taking up the study and practice of veterinary medicine, is entirely a post-war development in England, and we judge from comment in British veterinary publications, is an unwelcome one to the veterinary profession in that country. In this country, our veterinary colleges have had occasional women students for twenty-five years, but until recently their number has been small and the woman veterinary graduates in this country altogether probably are fewer than the women veterinary students now in college.

In the past year, there was a large increase in the enrollment of women taking courses in veterinary medicine in the colleges of the United States. It seems that after a few women had shown enough courage to enter the veterinary field, others readily followed.

There is an undetermined opening for the women who are interested in this line of work, their major activities being along the lines of small animal practice and laboratory work.

There were at least 12 women enrolled in veterinary medicine during the year 1931-1932. Three enrolled in the College of Veterinary Medicine of the State College of Washington are: Mrs. Frances Bixby, a junior, of Port Townsend, Washington; Mrs. Stanley Robinette of Seattle, Washington, a sophomore; and Miss Patricia Henno of San Francisco, a freshman. Mrs. Bixby and Mrs. Robinette married young men who were veterinary students. Miss Henno

has been interested in veterinary medicine since childhood.

Two women are enrolled in this course at the Colorado Agricultural College, a senior, Miss Evelyn Herman of Denver, Colorado, and a sophomore, Mrs. Smith of Lebo, Kansas. Miss Herman is the daughter of Dr. A. A. Herman of Denver who has a small animal hospital. Miss Herman became interested in animals through her father, whom she helped with his work. She expects to graduate this spring and become the wife of a small animal specialist in California. Mrs. Smith was married early last fall, and her husband being enrolled in veterinary medicine, she changed to it. Mr. Smith is a son of Dr. J. W. Smith, a veterinarian of Lebo, Kansas.

There are three women enrolled in the Division of Veterinary Medicine at the Kansas State College. Miss Louise Sklar, a sophomore, one of the youngest students enrolled in this college, is interested in small animal work. Mrs. Thaller, before her marriage early this fall, was Miss Hilda Bryant of Slater, Missouri. She is a step-daughter of Dr. C. H. Honeywell, a veterinarian. She married a young man who is a senior in veterinary medicine. She plans to help her husband in his work. Miss Helen Richt who is a senior this year, plans to go into small animal practice or laboratory work. She is from Omaha, Nebraska. She was the first girl to enroll in this course at this college.

There are three women enrolled in the New York State Veterinary College at Ithaca, Miss Helen Goldhaft of New York City, a third-year student, and Misses Esther Tuck and Ruth Cross, both first-year students. There are already four women among the graduates of the New York School.

Mrs. Mary McCullom is a senior at Michigan State College. Her husband is a student at Johns Hopkins Medical College.

The University of Pennsylvania, School of Veterinary Medicine, will not admit women students.

It is not uncommon for the wives of veterinarians to help their husbands in their work even though they have not had

Miss Evelyn Herman

the training their husbands had. In the past they have helped in a number of ways, some of which are: By keeping their husbands' instruments clean and sterilized, by bathing and taking care of small animals, by giving anesthetics and by keeping records and accounts.

At present the women realize that if they have some professional training in this work, they will be able to help even more than they have in the past, and in increasing numbers are taking the veterinary course at the different colleges.

There are several promising fields of endeavor in veterinary medicine for women. One of them is the small animal or pets specialty, although one of the earlier women veterinary graduates—Elinor McGrath—went into general practice, which in those days was chiefly draft horse practice, in Chicago, more than 20 years ago and succeeded at it. Women are now raising silver fox and mink and they need some knowledge of the dis-

eases of these animals to make it a paying proposition.

Another field is in the laboratory. In general, women are more efficient and inclined to care for detail and routine tasks, which laboratory work requires, than are men. Many commercial laboratories now employ college women. There is also the research laboratory for hospitals, institutions, etc., where women admirably fit in as technicians and research assistants.

Although there is a place for women in veterinary medicine, and probably will be an even better field in the future, no woman should take up this profession, unless she is adapted and fitted to surmount the difficulties common to pioneering.

Helen Richt,
Manhattan, Kansas. K. S. C., '32.

ENDOCRINE GLANDS

WITH the discovery of the functions of the ductless glands, an entirely new type of control of bodily function was brought to light. The internal secretions have control over slowly moving processes, such as the development of particular organs, the growth of the body as a whole and metabolism of food materials—processes measured by months or years; whereas the nervous system controls the rapid processes of thought, muscular activity, and the external secretion of glands.

In recent years, much research has been done dealing with ductless glands and their functions. A few points of interest elucidated in these investigations will be enumerated.

Adrenals

The adrenal gland is divided into two parts, the medulla and cortex, each supplying a hormone.

Adrenalin is the hormone produced by the medulla. Its chemical formulae is known. It has been synthesized in the laboratory.

The functions of adrenalin are to control blood pressure and metabolism. Adrenalin is liberated into the blood stream under excitement, as when a mother is called upon to protect her young, or when unusual strength is exhibited.

Cortin is the hormone produced in the cortical portion of the adrenal gland, the lack of it results in Addison's disease. By administering cortin to patients suffering from Addison's disease, their lives may be materially prolonged.

The adrenal gland may be said to control blood pressure through control of the sympathetic nervous system. It supports cardiac action and maintains muscular tone.

Thyroid

Thyroxin is the hormone produced by the thyroid gland. It regulates metabolism and growth. The chemical formulae has been worked out and it was found to be an iodine derivative of the amino-acid tryosine.

The lack of thyroid development and adequate thyroxin production results in retarded growth—cretinism. The lack of iodine in the diet causes goiter; over activity of the thyroid causes exophthalmic goiter.

Parathyroid

The parathyroid gland produces a hormone which regulates calcium metabolism. An abnormal functioning of this gland produces a disturbance in the calcium phosphorus balance in the body—osteomalacia and other bone disorders.

Pancreas

Insulin is the hormone produced in the pancreas. It regulates carbohydrate metabolism. Inability of the pancreas to produce insulin results in the failure of the oxidation of sugars which accordingly accumulate in the blood, producing diabetes. Insulin may be extracted from the pancreas and given daily by subcutaneous or intravenous injections, to facilitate the metabolism of sugar. This treatment is a routine measure in diabetes of man.

Pituitary

The pituitary body is divided into an anterior and posterior lobe. Four hormones have been obtained from the anterior portion, controlling growth, sex development, ovulation and growth of hair. From the posterior lobe two hormones are produced—*hypophamine A* and *hypophamine B*. The former stimulates uterine contraction and the latter controls water balance and influences blood pressure. When the pituitary fails to function properly gigantism, infantilism, acromatism, polyurea or obesity may result.

Ovaries

The graafian follicle produces two hormones—*theelin* and *progestin*. They control the estrus cycle and the growth of the mammary gland.

In the corpus leuteum two hormones are found, one, *relaxin*, prepares the mother for parturition and a second controls fetal developments. Diseased processes involving the ovaries to the extent of inhibiting the formation of these hormones may lead to irregular menstruation, sterility or abortion.

The ovarian hormones may be used in diagnosing pregnancy since the urine of pregnant females contains a high concentration of theelin or the sex development hormone of the anterior lobe of the pituitary and of the testicular hormone. By injecting the urine of pregnant animals into female mice the uterus will begin to enlarge within a short time. This is known as the Aschheim-Zondek test for pregnancy.

Testicle

A hormone is produced in the testicle which produces the secondary, sexual characteristics in the male.

From the remaining ductless glands, the thymus and the pineal, no hormones have as yet been extracted.

David Engle, K.S.C., '32.
Manhattan, Kan.

KANSAS' LIVE-STOCK REMEDY LAW

THE Kansas live-stock remedy law was the first legislation of this kind in the United States, having been enacted in 1907 as a part of the state's feeding stuffs law. Apparently the idea then was to permit anyone to sell anything as a live-stock remedy, provided the name of each ingredient, the actual percentage of certain very active ingredients, if used, and the maximum percentage of fillers, if any, was stated in the application and on the label. In other words, it was the belief then that when a complete statement of the composition of a remedy was attached to its container, a customer could buy intelligently with full knowledge of the ingredients of the product.

The thought in the minds of those who framed the law seems to have been that if this information was given to the public, it was all the information necessary to enable purchasers to protect themselves.

It was provided in the law that the English name of each ingredient must be given on the label, thus heading off the use of Latin or other foreign language; but, later it was found that many of the purchasers of these remedies knew very little about the ingredients, even when the English name of each was given on the label. Therefore, a sort of glossary or medical dictionary was prepared and published along with the law and the regulations thereunder in the hope that it would be of assistance to purchasers of these remedies in determining their probable efficiency and whether or not the commodity was worth the price.

It became apparent, however, that in order to protect the public the provisions of the law were not sufficient, even when supplemented by the information given in connection with the law. The last legislature made the live-stock remedy law far more stringent than it had been by requiring, not only that the English name of each ingredient of a remedy, the actual percentage of certain very active drugs, and the maximum percentage of any ingredient used as a filler —that is, to dilute a remedy or increase its bulk or weight — shall be given in the

application and on the label, but also that a copy of the label and of such advertising as is proposed for the remedy shall be submitted with the application, and by inserting in the penalty section a clause somewhat similar to the Shirley Amendment to the Federal Food and Drug Act, making it a punishable offense when the label of such live-stock remedy or any advertising or representations either printed, written, or oral relative thereto bears or contains any statement, design, or device regarding the curative or therapeutic effect of such live-stock remedy, or any of the ingredients, or substance contained therein which is false or fraudulent. This makes it possible for us to afford our people still more protection from unscrupulous or misinformed manufacturers and salesmen than was possible under the old law as we can now check up not only on the truthfulness of the label in regard to the ingredients, but also in regard to the truthfulness of the advertising and statements in regard to the curative or therapeutic action of the remedy.

Careful consideration is always given to the wording of the statements on the label and in the advertising submitted with the application concerning the curative or therapeutic effect of the remedy. Application has been and will be refused only in those cases wherein it is believed that such statements on the label or in the advertising are false or fraudulent or decidedly misleading.

After an application has been accepted and the remedy is registered the registration can be canceled when it has been accepted in error, or it is found that the composition of the remedy is not as stated, or that it does not have the therapeutic action claimed for it either on the label or in the advertising or when its manufacture is discontinued.

The Federal Government is able to prove the false and fraudulent character of the statements made on the label in regard to the curative or therapeutic action of some of these remedies, and we can now go even farther than the government can, as it is restricted to statements on the label itself or on advertising accompanying the goods, whereas we can take action if *any* statement, design, or device in or on the package, label, or *other advertising* as to the curative or therapeutic effect of the remedy or any of its ingredients is found to be false or fraudulent.

According to information furnished us by the Federal Government, there is no known drug or combination of drugs administered internally or by inhalation which constitutes a competent treatment for the following diseases:

Contagious or infectious abortion—all animals.
Anthrax or charbon—all animals.
Aphthous fever or foot and mouth disease—all cloven and hoofed animals.
Blackleg or quarter Ill.—cattle.
Texas fever—cattle.
Betryomycosis—horses.
Calf diphtheria.
Calf pneumonia.
Distemper or strangles—horses.
Distemper—dogs and cats.
Dourine—horses.
Glanders or farcy—horses.
Fowl typhoid.
Hemorrhagic septicemia—all animals and poultry.
Swine Plague.
Chicken Cholera.
Catarrhal fever of sheep.
White scours of sucklings.
Dysentery of calves.
Navel ill of sucklings.
Joint evil of sucklings.
Hog cholera or swine fever.
Influenza—horses.
John's disease—cattle.
Rabies—all animals.
Tetanus—all animals.
Tuberculosis—all animals and poultry.
Necrotic enteritis—swine.
Bacillary white diarhea—poultry.
Coccidiosis except milk food products—all animals and poultry.
Fowl pest—poultry.
Blackhead—turkeys.
Azoturia—horses.
Chorea—dogs.
Forage poison—horses and cattle.
Sterility—all animals.
Roaring or thick wind—horses.
Mammitis or garget—cows.
Diseases of the bone with external tumorous growths—all animals.
Infectious bronchitis—poultry.
Avian diphtheria or chicken pox—poultry.
Aspergillosis—poultry.
Limber neck or botulism—poultry.

A. E. Langworthy,
State Board of Agriculture.
Topeka, Kansas.

Necessity for Practice Records

By W. L. JONES, Manhattan, Kansas
Kansas State College, Class of 1932

RECORDS are valuable in any line of work. If it is not taken down in black and white an incident is soon forgotten. Records are the only accurate means of knowing what has been done, or what has occurred in the past.

A veterinarian's records are quite necessary in giving him information concerning vaccination work; such as, hog cholera, rabies and black leg vaccination; and for mallein, tuberculin, pullorin and abortion tests. Records to be complete should give the name and address of the owner, the species of the animal, the serial number of the product used, the date on the label, the amount used and the date of vaccination, also the expiration date given on the label.

The veterinary service of the U. S. Army has demonstrated conclusively the high value of records of rabies vaccination. During 1930, of 4,012 dogs vaccinated against rabies by army veterinarians, only three died of the disease.

Breeding records are indispensable to a proper handling of sterility. They provide the only sure way of knowing the past breeding experience of the animal; what treatment has been applied and the result. It is advisable to make at least two copies of such records; leaving one copy with the owner of the animal, the other copy should be kept in the veterinarian's own files. In this way the record is more certain to be available when needed.

Records are of value to the veterinarian in reviewing the year's work. One can check back and determine financial standingings, and compare profit and loss of this year with that of previous years. It eliminates guess work. We would not think much of the prospects of a business man who kept no records, nor would we want to keep our funds in a bank that was so careless as not to keep adequate records of its operation.

By referring to records, misunderstandings can many times be cleared up; they also give aid in case a law suit should arise.

A woman brought her dog to the hospital to be boarded for one month. One week after taking her dog out of the hospital she returned the dog to be bathed. Two weeks later, she filed suit against the veterinarian for $600.00, claiming her dog contracted an incurable disease while staying at the hospital.

The hospital was one in which an entry card is made out in duplicate for every case received into the hospital, one copy being given to the owner of the animal. The doctor referred to his records and showed the court that under "ailment" had been written "none" on this dog's card when it was brought in for the bath, and the owner had made no complaint at the time. The case was thrown out of court.

Another incident: A woman brought a valuable chow to a veterinarian to be spayed and asked if the operation were a dangerous one. On being told it was not, she said to go ahead with it, but she didn't want to lose the dog as it was worth $5,000. (How could a dog save that much money in such times as these?) The patient died and the owner sued the veterinarian for $5,000.

This veterinarian used an entry card for hospital patients that in addition to the usual blank for a description of the patient and the diagnosis, contained a statement of the rates for boarding, hospitalization, clipping, bathing and some of the more common operations, with the terms of payment. The card also contained at the bottom in bold face type, "While scientific treatment in accordance with the best known methods is used in all cases, in no case is a cure guaranteed." And, under it, the printed signature of the veterinarian. In the corner, opposite his name, the veterinarian signed his initials as the one admitting the patient to

the hospital. Routinely, a duplicate of the entry card was given to the owner on entering patient and was done in this case.

The court held that while the statement that an operation was not dangerous might reasonably be interpreted to mean that there was no danger in it, and possibly that the veterinarian thereby gave an implied guarantee that the patient would not die as a result of the operation, it is a well-recognized principle of law, that a verbal agreement can not nullify or amend a written agreement, and that the entry card, a copy of which was possessed by both parties, was in fact such an agreement; that the statement on the card governed. The plaintiff lost the suit.

Post vaccination trouble in swine has resulted in a multitude of damage suits. Almost never do the serum companies lose these suits chiefly because of the very complete records they have of the products used. Veterinarians have lost many of these suits, but I do not know of a single such case that a veterinarian has lost where he had made and kept an adequate record of the number, age, weight, and physical condition of swine, with his recommendations as to pre-vaccination preparation, and post-vaccination care, and a record of the kind and amount of serum and virus used, with the serial numbers and expiration dates.

Such evidences of care and competence on the part of the veterinarian impresses the court and jury with the belief that the veterinarian was probably equally careful and competent in his professional work. The lack of records give them the opposite impression, that the veterinarian was probably equally careless, indifferent or incompetent in his professional work.

No properly managed business can be conducted without an adequate set of records; therefore, it behooves every veterinarian to keep good records available for his use at all times. Records make one's experience available for future use, and it is surprising how much may be learned from them. And, in addition to keeping case records for one's own professional improvement and progress, there is the obligation to keep them for one's protection.

ARTHRITIS OF DIETARY ORIGIN IN LAMBS

November 22, 1931 a shipment of 1812 lambs arrived at a feed yard near Kansas City. These lambs were from New Mexico and arrived in good condition. After a feed of prairie hay and screenings, they were given a heavy feed of oil meal for the purpose of elimination. They were then put on a ration of corn, alfalfa meal, barley and oil meal. The concentrates were increased gradually and the lambs did well until about the 15th of December, when the attendant noticed a few lame lambs. The lameness was apparently confined to one leg in the beginning but within a day or two, the other legs became affected and the lambs would not, or could not, get up, but when helped to their feet, they would limp to feed and water, and in spite of the lameness practically all were in fair condition. None of the lame lambs died. About 200 were affected on December 30th.

The onset of the lameness was sudden. December 20th two carloads (about 300) unaffected fat lambs were sorted and shipped to market. Fifteen of them were very lame in the stock yards the following morning. The affected lambs showed a normal temperature; the joints were not enlarged but were sensitive to pressure.

Autopsy: All structures and organs were normal except that practically all joints and some tendon sheaths contained an excess of fluid which, in most cases, was purulent. Three of the legs were taken to a laboratory for further examination. The joints and tendon sheaths contained a purulent synovia. Slides were made of the purulent fluid from different joints and an abundance of pus cells and a few clumps of small gram-negative bacilli were found. Numerous cultures were made from various joints but they all remained sterile.

No diagnosis, other than arthritis, was made. It was suggested that the protein feed be diminished and a mineral that contained phosphates be supplied. There was an improvement immediately following this change of feed.—A. T. K.

Lambing Paralysis

By R. H. MILLS, Sacramento, California
California Department of Agriculture, Division of Animal Industry

MANY cases of lambing paralysis have been observed this year, and it is for this reason that we believe a discussion of this subject at this time is especially appropriate.

This disease is discussed in veterinary literature under a great many headings, such as preparturient paresis, pregnancy disease, acidosis, lambing paralysis, pregnancy toxemia, and stercoremia. Investigators have shown that in practically all instances, the urine is changed from alkaline to acid in reaction and that most of the alkaline buffers are removed from the blood stream. This condition is described as a pregnancy acidosis.

The cause of this disease is not well understood but it has been demonstrated that it is not of a contagious or infectious nature. It always occurs in ewes well advanced in pregnancy and principally in those animals carrying twins or triplets. Because of the large number frequently affected in a flock, an owner may believe he has an outbreak of a serious contagious malady, but this is not the case. It is the consensus of opinion that the predisposing factor is lack of exercise. In most instances, this condition occurs in sheep that are handled under range conditions and are corralled and given additional feed prior to lambing in order to assure an ample flow of milk for the young lambs. When an abundance of feed can be obtained easily, ewes heavy with lamb will not take the required amount of exercise, even though they are on a range and have ample area on which to move.

In the first stages of the disease, the ewe becomes drowsy. She will separate from the band, will not eat or drink, and may hang the head or hold it with the nose pointing to the sky. The animal is generally constipated. In a few hours, she will be found down and cannot rise. Many of the animals show trembling of the body muscles. In some, a frothy discharge is noted from the nose and mouth. The animal will remain in this stupor for several days and finally die. It generally strikes the older sheep and those in the best condition. It is to be differentiated from other diseases that show a similar weakened condition, such as animals that are too weak through lack of feed or from infestation of parasites to finish the period of pregnancy. Occasionally, the two conditions are observed in the same flock, where both pregnant and non-pregnant animals are found down. These conditions should be differentiated so that proper treatments can be instituted.

In lambing paralysis, autopsy reveals but little in the way of diagnostic lesions. The liver will be found lighter in color and very friable. Acute nephritis is generally noted. The urine may be cloudy or contain a precipitate, will be acid in reaction, and generally contains albumen. Twins or triplets are frequently found, but occasionally, only a single lamb is present. If the latter occurs, the lamb is exceptionally large.

There is no effective treatment for the affected animals. However, if abortion occurs, many will recover. The losses can be materially reduced if ample exercise is enforced. There are many ways of accomplishing this. The easiest way is to withhold all supplemental feed for about forty-eight hours and then turn all heavy ewes on sparse pasture. Another way is to withhold feed for a day and then have the band follow the wagon to new feeding grounds about two miles away from the home corral. The flock will readily follow the wagon and after feeding, return to the corral for water, thus

obtaining about four miles exercise daily, which should be the minimum. The feed should be cut down. As the lambs arrive, they are placed with their mothers in a separate band. These should be well fed as all danger is over after the ewe has lambed.

Summary

1. Ewes advanced in pregnancy frequently fall victim to a malady commonly called "lambing paralysis."
2. The condition is a true acidosis.
3. The exact cause is not known however, lack of exercise and too much feed appear to be the predisposing factors.
4. There is no satisfactory treatment for affected ewes.
5. Enforced exercise will prevent the occurrence of this condition.
6. When the ewe has lambed there is no further danger from this source.

OVEREATING DISEASE IN SHEEP

This ailment is referred to variously as food intoxication, protein poisoning, gastro-enteritis, indigestion of feeder lambs, etc. A description of a typical occurrence of this trouble follows:

History.—This band consisted of about 7,000 sheep. Nineteen hundred of them had been shipped from Utah, recently. Soon after the Utah lambs were added to the band, it was divided into three equal parts. One flock was placed on alfalfa pasture, one on cane pasture, and the other on prairie pasture. Weather conditions for September, October and November were ideal for feeding. About October 10th, the sheep were placed on a ration composed of alfalfa hay and one-half pound of grain consisting of equal parts of wheat and barley. No provisions were made to prevent individual animals from receiving more than their share of the feed. The farm was visited November 13th. Up to this time, 75 had died.

Symptoms.—The largest, strongest and most vigorous animals were the first to die. Most of the casualties were observed about feeding time at night or early in the morning. The affected sheep were first noticed to lag behind the flock, then to stagger and fall, some going into convulsions and dying within a few hours. In many instances just preceding death, they would manifest a tendency to throw their heads back, run into fences or other obstacles and show indications of a disturbance of the central nervous system. In a few cases, diarrhea was observed.

Postmortem Findings.—The first lamb to be examined had been sick about three hours. Its temperature was normal, but the mucous membranes were of brick-red color. This animal was killed, and the autopsy showed a severe gastro-enteritis, accompanied by large blotchy hemorrhages of the small intestines. A few hemorrhages were found on the epiglottis. Later three other sick sheep were examined, all of which showed a rise in temperature. These were killed and on postmortem examination, the same lesions were observed, as in the first animal and in addition cortical hemorrhages of the lymph glands of the entire body were noted. They showed also some pneumonia which was considered as of secondary importance.

Diagnosis.—A diagnosis of overeating disease was made.

Treatment and Control.—The farmer was advised to isolate all the sick sheep from the flock immediately, and give them four ounces of Epsom salts. For the remainder of the flock, he was advised to reduce the grain feed to one-eighth pound of barley and wheat the first day. Then increase the ration one-eighth pound daily until they were receiving one-half pound of grain daily and hold them on this ration for four days before any further increase was made; then to increase the feed one-eighth pound daily again. By this gradual method he could bring his sheep back to full feed. He was also instructed to so manage his feeding that each animal would have an equal chance with every other animal to get its share of the feed. The farmer was asked to report any further losses that might occur, and up to this time, January 15th, no losses have been reported.

M. E. Hodgson,
Manhattan, Kansas. K. S. C., '32.

A Case of a Cerebral Traumatism

By V. H. CLARK, Manhattan, Kansas
Kansas State College, Class of 1932

A BAY MARE weighing about 1,000 pounds was brought to the veterinary clinic of the Kansas State College. A case record sheet was duly made out and the mare then given a general physical examination. The case was a bay quarter-bred horse, bred primarily for polo or riding purposes. The animal was in very good condition, with respiration 24 per minute, pulse 32 per minute and temperature 102 degrees F., all very nearly normal. The mucous membranes were normal as were the digestive and urinary tracts, as far as could be ascertained. The teeth upon examination were found to be in excellent condition, and indicated that the mare was a five-year-old. The natural standing posture of the mare was with the body relaxed and the head hanging slightly. The head was twisted, seemingly at the articulation formed by the atlas and the axis, throwing the poll of the head to the right and the nose some distance to the left of the median plane. On checking the history, that of a fall, this twist was thought to have been caused by a fracture of the atlas or axis. The eyes were crossed and the pupils widely dilated. The mare was totally blind. The ears were usually cocked forward or were moving restlessly. Numerous bruises and abrasians about the head indicated that the mare could not find her way about without running into obstacles.

When placed in a large box stall this animal walked in small circles always to the right. This case remained in the hospital for three weeks and during this time, at frequent intervals and without an observable reason of any kind, the mare would start walking in small circles, perhaps five feet in diameter always turning to the right. Sometimes she would bump into the walls, thus keeping her head more or less bruised. She did not seem to develop the "sixth sense" by which blind horses usually judge the nearness of objects, directions, etc. After about ten or fifteen minutes of walking she would become quiet, standing in the stall in a slightly dejected manner, with her head hanging listlessly. The only interest or intelligence shown by the mare was in feeding. She would walk toward a rattled feed or water pail, and when fed hay, would eat steadily until the feed rack was empty, and would drink as often as water was brought to her. Frequently, when she had eaten her ration of hay she would feed for a length of time on the straw of her bedding. The appetite was very abnormal.

The mare would pay no attention when spoken to and would jerk back violently when touched, though she showed no other indication of deafness.

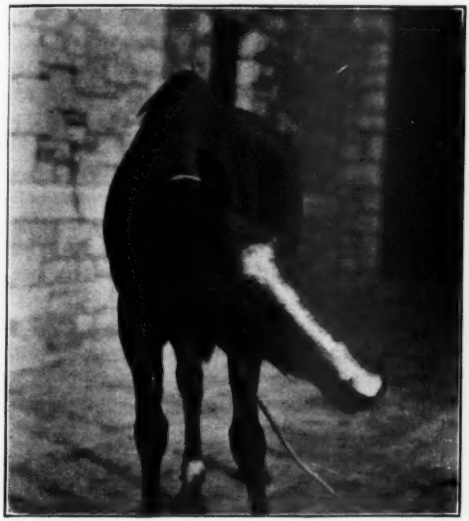
At the time the mare was injured, about eight months previously, restraint in the form of hobbles was being used in grooming. The animal became excited, reared and fell backward striking her head in the region of the poll, upon the concrete floor. From that time she showed the symptoms described above, but in a far more exaggerated manner in the beginning. For approximately a week after the accident the mare neither ate nor drank, due to the apparent hyperesthesia which caused her to "fly back" when her nose touched feed or water. She also showed great fright when touched though a loud noise did not bother her. Blindness and twisting of the head with the cross-eyed appearance was noticed from the time of injury.

For some time, when the mare would run into any object, she would be very much frightened, lose her balance and fall, being unable to rise for several minutes, because of the muscular twitching-tonic-clonic spasms over the whole body.

The mare could not be led by the halter because she would rear and fall when the halter rope was pulled upon. The men at the ranch "herded" by placing a rope behind her in such a manner that a man was on each side to pull on the rope and guide

her along when she was to be moved. She made very slow but steady improvement, and at the time she was in the hospital could be led by a halter and handled easily, if one handled her very carefully and slowly. It was decided to destroy her because of the permanent blindness and the uncertainty in handling, making her unfit for riding.

Postmortem Findings.—No fractures of the axis, atlas or cranium were evident. Amaurosis or blindness without visible lesions was present. There proved to be no



Cerebral Traumatism eight months after the injury

apparent pathological changes in the optic thalmus, optic tracts or optic papillae. Two small blood clots were found floating in the viterous humor of the left eye. Adhesions were formed between the two layers of ependyma lining the lateral ventricles of the brain. There was enlargement of the third and fourth ventricles with a marked enlargement of the choroid plexus of both, and hemorrhage located along the floor of the fourth ventricle involving a portion of the left side of the medulla. There was slight enlargement and blackening of the pineal body, with loosely organized fibrin surrounding it.

Pathogenesis.—In the foregoing, it will be seen that no evident fractures of the cranium or cervical vertebrae were found. It is supposed that in falling backward, the poll of the head may have struck the concrete floor in such a way as to extend the head much farther than normal, stretching the atlanto-occipital ligaments, injuring the spinal cord and medulla by stretching, which with a sudden surge in blood pressure resulted in hemorrhages in the sensitive areas mentioned. This produced an increase in the accumulation of fluid in the ventricles of the brain and their consequent enlargement. The enlargement of the third ventricle placed considerable pressure on the optic thalmus, which undoubtedly was responsible in part, for the blindness.

The gradual recovery of the animal may

Cerebral Traumatism—There was total blindness but no lesions to explain it

have been due to the evident resorption of the blood clot found in the left side of the medulla and the fourth ventricle. The habit of turning to the right in walking was evidently due to the blood clot found on the left side of the medulla. No cause for the floating blood clot in the vitreous humor of the eye could be found. However, it may have resulted from the rupture of a capillary during the rapid cerebral congestion that must have followed the fall. This congestion being the result of raised blood pressure as a result of fear and nervous excitement following the trauma.

Observations on the Course of Enterohepatitis in a Flock of Turkeys Naturally Infected

By CARL F. SCHLOTTHAUER, D.V.M., and HIRAM E. ESSEX, Ph.D.,
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THE LITERATURE contains numerous reports on the course of enterohepatitis in flocks of turkeys under experimental conditions, but few studies appear to have been recorded of flocks under average range conditions. We are reporting here our observations on enterohepatitis in a flock of turkeys spontaneously infected. Nothing was done to prevent the disease taking its natural course. These observations illustrate the peculiar behavior of this disease in spontaneously infected flocks.

At the age of four weeks 154 turkeys, hatched from eggs produced by a flock free of enterohepatitis, were moved to a farm where chickens had not been kept for the previous three years. They were placed in a new brooder house situated on high, well drained, grass-covered ground, somewhat remote from the farm buildings. This was the poults first contact with earth. They were all apparently in good health. Symptoms of enterohepatitis had not been observed in this flock and lesions of the disease were not present in birds at necropsy before removal from the brooders.

July 16, twenty days after beginning their outdoor existence, one of the larger poults was found dead. Necropsy revealed typical lesions of enterohepatitis, and *Histomonas meleagridis* was demonstrated in the lesions of the liver. The remaining poults all appeared to be in good health. The brooder house was cleaned; it and the turkeys were then moved to a new site. Following this, further deaths from enterohepatitis did not occur until July 31, when another large turkey succumbed to the disease. The remaining apparently healthy turkeys were then permitted to range at large. They spent most of their time in the fields; however, they did occasionally come into a farm yard where chickens had ranged three years previously.

The next death due to enterohepatitis occurred one month later, August 31. From that date one or two turkeys died each week of enterohepatitis until the week of November 1 to 7 when five died. November 11 only ninety-five turkeys remained in the flock, fifty-nine having died of enterohepatitis or other causes. On this date, fifty-six were confined in an old cattle barn for the purpose of fattening. For convenience, they are designated group 1. The remaining thirty-nine turkeys, group 2, were permitted to range at large.

Group 1. One turkey died of enterohepatitis during the first week of confinement. November 25 the remaining fifty-five turkeys were killed for meat. Only one revealed lesions of enterohepatitis. This bird had very extensive lesions in the cecum and liver, and undoubtedly would have succumbed.

Group 2. One turkey of this group died of enterohepatitis November 30. The lesions were extensive and *Histomonas meleagridis* was readily demonstrated. Prophylactic treatment was not attempted and special precautions were not observed to prevent further spread of the disease in this flock. However, further deaths did not occur during the following three months, and the birds all remained apparently in good health. As early winter in Minnesota was very mild in 1931, we cannot attribute the sudden checking of the disease to hard freezing or heavy snows.

These observations are of interest because they so clearly demonstrate the peculiar behavior of this disease. Enterohepatitis tends

to appear persistently in some flocks whether they are confined or on range, taking a steady toll for days or weeks, and suddenly the disease disappears from the flock. This emphasizes the importance of refraining from drawing definite conclusions regarding the efficacy of treatment of the disease. Had treatment been administered to this flock when the greatest number succumed to enterohepatitis, the cessation of losses could have been erroneously attributed to the treatment.

We are unable to explain the first appearance of enterohepatitis in this flock on the basis of contact with infected fowl or ground contaminated by them. These turkeys did not come in contact with ground on which chickens had ranged recently until after September 1, and then only occasionally. The man who cared for the flock lived on this farm and had no contact with chickens in his everyday work. Sparrows and other wild birds were not excluded from the turkey yards. It is possible that they may have introduced the disease in this flock. However, since the disease did not appear until after the poults came in contact with earth, the possibility of earth-borne infection is ever present.

A PROPOSED USE FOR SODIUM THIOSULPHATE

This chemical, known to photographers as "hypo" has long been used in photography, because of its property of dissolving silver chloride and iodide. It is used also in the calico and dyers trade to reduce indigo blue to indigo white. Although it is quite commonly called sodium hyposulphite, this is not strictly correct as it is sodium sulphite to which an atom of sulphur has been added, hence the prefix thio which means sulphur. The formula is $Na_2S_2O_3$. It is thus essentially sodium sulphate or glauber's salt, in which one atom of oxygen has been replaced in the molecule by an atom of sulphur. A 1 to 10 aqueous solution is neutral to slightly alkaline. It is colorless, odorless, transparent, monoclinic, prismatic and has a cooling and afterward a biting taste.

The therapeutic indications for sodium thiosulphate are, as an antizymotic to prevent the growth of Sarcinae, *S. ventriculi* and certain yeasts in the ailimentary tract, as a local sedative in mange and ivy poisoning, as an antidote when used intravenously in arsenic, mercury and bismuth poisoning, and as a solvent to remove silver nitrate and iodine stains from the skin. It has been used empirically in human medicine in the treatment of a condition known as malarial hematuria.

The principal use, however, at the present time, is for parasitic skin diseases of the human. Recently it has come into great popularity for a treatment of that form of ringworm popularly known as "athletes foot" or "Shanghai foot." Many gymnasia are now equipped with shallow pools or pans of a thiosulphate solution through which bathers must walk in going to and from the swiming pool or shower baths.

Of late, it has been used to some extent in the treatment of ringworm of animals with varying success. The popular application has been: sodium thiosulphate one dram, and water one ounce. In a trial made at this institution, this did not prove satisfactory because the solution could not be kept on the affected area at all times. An ointment was made with this formulae:

℞

Adipis Lanae, Anhydrosi..28 gms.
Sodii Thiosulphatis ..... 4 gms.
Aquae Destillatae..... 2 cc.
Misce et fiat unguentum.

Dissolve the sodium thiosulphate and water; and add the solution to the wool fat, a few drops at a time and mix. The resultant yellow paste is applied to the affected part as necessary until healed. From the experience gained I would say not to use heat in making this preparation as it destroys its anti-parasitic properties.

So far as I know, it has been tried very little in veterinary medicine. In view of its present popularity in human medicine, sodium thiosulphate probably merits a more extensive trial as fungicide in veterinary medicine.

John H. Rust,
Manhattan, Kansas. K. S. C., '32.

The Lariat in Veterinary Practice

By FRED F. SCHMIDT, Manhattan, Kansas
Kansas State College, Class of 1932

IN handling animals, there are many uses for the lariat. The veterinarian that is adept in the use of the lasso will find it a daily convenience, one might almost say a constant necessity. In castrating colts it may be used for catching, casting and tying. Any animal that is to be tied down may be quickly tied with a lasso. The removal of tusks in old boars, or holding large sows for vaccination may be facilitated by noosing the upper jaw with a lariat and fastening the other end to some stationary object. When the obstetrical chains have been forgotten the lasso may be substituted for them. The cotton rope works best in such cases. Usually vicious horses may be controlled easily by the use of a war bridle made from the lasso. The most simple and effective casting harness for cattle is the lariat as it can be adjusted

The largest bull may be cast with a lariat and held down easily

in a hurry and serve the purpose very well (see illustration). Young animals that are to be hauled in automobiles, especially under the back lid, are hard to control there if they are not tied down. Heavy objects, such as hog crates, dog crates, etc., may be tied on the side of the car with the aid of the ever useful lariat. The lariat has pulled more than one practitioner out of a bad hole, being used as a mud chain or as a towing rope.

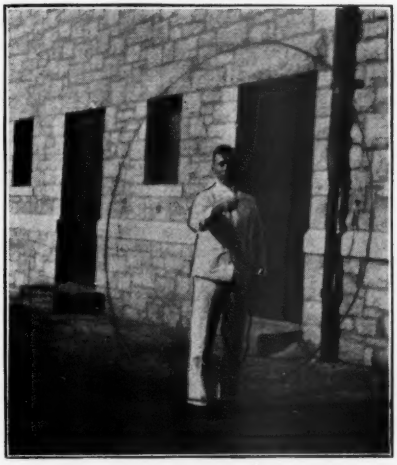
There are several kinds of lariats. The choice of the lasso depends largely upon the taste of the purchaser. The weather conditions in some localities may make considerable difference in the choice of a rope. The cotton rope is undoubtedly the best for a wet country. The cotton lariat does not become unmanageable when wet, and when dry makes a fair lasso. The rope most commonly used by the practitioner is the three strand hard twisted manila. This is very strong and is an excellent throwing rope. Then, there is the grass rope, rawhide lariat, and the hardware store rope. The last named rope in the opinion of the author serves best for bringing up the old oaken bucket.

The hondas (hondoos) of the various lassoes are fairly uniform in size and shape. Some of the hondas are round, others oval and still others are distinctly egg shaped. They may be of copper, brass or aluminum, depending upon the weight desired. The honda that has come into prominence recently is the breakable one. This honda serves its purpose very well, but it certainly does not have the proper weight for throwing. The choice of hondas is also one of personal taste.

The art of roping is fast disappearing; it is well for the practitioner to know a little about roping, soon there may be no one to do roping for him. It is no more necessary that he become a second Will Rogers in roping than it is essential that he become a comedian. All the thrower needs to know about roping is the art of keeping the loop open when he is attempting to catch an obstinate patient, and the proper time to throw the rope so that the loop encircles the patient's head. There have been no cases reported of a practitioner losing clients

because of being a good roper, on the contrary the veterinarian who is handy with the lariat is envied by his clientele.

The lariat should be a standard part of every general practitioner's equipment for it is as important as his drugs or instruments. Of course, to get the best results from a lasso it is necessary that it be well cared for. It should not be allowed to become impregnated with the various drugs that are present in the back of the cars of too many practitioners. When the lariat is not in use it should be neatly coiled. A lasso that is coiled when not in use certainly gives better results in casting than the one that is thrown loosely into the back of the car. A very thin coating of beef tallow applied to the lariat when new, helps to prolong the life of the rope. Every practitioner has his own individual ideas about ropes in general, and how they may be used. The usefulness of the lariat is proportionate to the practitioner's knowledge of how to use it. If you have not been using a rope, get a good one, and see how handy it will become.



All that is necessary is to keep the loop open and cast it to ensnare the neck or a leg. The author demonstrating keeping the loop open

Any veterinarian can learn to handle a lasso

PICA—LICKING DISEASE

Pica is a blanket term covering various conditions resulting from the long continued feeding of rations deficient in one or more essential nutrients. In cattle, calcium, phosphorous and iodine deficiency are the ones most commonly seen. These conditions may be manifest in a number of ways, depending upon the food constituent that is lacking. Deficient rations result in altered metabolism, if allowed to continue with no regulation of the diet. It results in licking, gnawing and devouring inedible objects, such as bones, rotten wood, manure, urine soaked bedding, etc.

Bone chewing—Osteophagia, a specific form of pica. In milder forms only the best sun-bleached bones are eaten; in aggravated forms all bones, even putrefying bones from rotting carcasses, are eaten. In extreme cases osteophagia may develop into allotriophagia when any sort of rubbish will be chewed

In certain localities of the middle west, where alfalfa is raised to a very limited extent, a calcium deficiency in cattle oc-

curs more often than is commonly supposed. I have observed cattle in the southeastern section of Kansas, where alfalfa and other legumes are raised only to a limited extent, that become anemic, emaciated, fail in milk production, go down and are unable to rise without assistance. These same cows, if the conditions were not too far advanced, would regain normal health and production when alfalfa hay and steamed bone meal were added to the ration.

The following cases were presented at the veterinary clinic of the Kansas State College, September 28, 1931.

Cow No. 1 was a normal cow used as a control.

Date	Cow	Temperature	Respirations	Pulse rate	Mucous membranes	Remarks
9-28-31	1.	102.0 F.	32	48	Normal	
	2.	102.0	35	84	Anemic	Resp. & Pulse fast
	3.	102.5	36	72	Anemic	Resp. & Pulse fast
9-29-31	1.	102.0	36	56	Normal	
	2.	102.0	24	80	Anemic	
	3.	102.5	28	84	Anemic	
9-30-31	1.	102.0	44	48	Normal	
	2.	102.5	28	76	Anemic	Pulse fast.
	3.	102.8	36	92	Anemic	Pulse fast.
10-1-31	1.	102.8	48	52	Normal	
	2.	102.0	28	64	Anemic	Anemic, with fast pulse.
	3.	102.6	32	84	Anemic	
10-5-31	1.	103.2	48	90	Normal	No. 1, Calved
	2.	102.4	28	68	Anemic	10-6-31
	3.	102.0	32	64	Anemic	
10-10-31	1.	102.3	31	57	Normal	
	2.	102.4	42	69	Slightly anemic	Pulse fast
	3.	102.6	60	56	Normal	
10-15-31	1.	102.0	24	68	Normal	
	2.	100.8	20	60	Slightly anemic	
	3.	101.1	22	72	Normal	
10-20-31	1.	102.2	24	68	Normal	
	2.	100.8	24	60	Slightly anemic	
	3.	101.1	24	72	Normal	
11-5-31	1.	103.0	28	64	Normal	
	2.	101.0	24	68	Normal	
	3.	101.0	20	64	Normal	
12-5-31	1.	103.0	16	68	Normal	
	2.	102.0	14	64	Normal	
	3.	103.0	16	67	Normal	

Cows No. 2 and 3 had the following history: They had been used for dairy purposes and had been on a dry lot for about one year. Their ration had consisted of prairie hay and some grain. Cow No. 2 had calved in January 1931. Cow No. 3 had calved in February 1931.

After several months under above conditions, these cows began to lose weight, show dyspnea, anemia and an abnormal appetite, resulting in eating dirt, chewing wood, and old bones, etc. They would stand in a more or less depressed attitude, occasionally extending the head as shown in the illustration. After they had assumed this position, they would extend the tongue and continue to lick at imaginary objects in the air until they were disturbed. They became very weak physically, and their milk production dropped over 50%. The normal estrus cycle was entirely absent.

The following table is a check made on the cows at the lowest point in the deficient diet. A very careful physical examination was made on the days recorded.

When the cows were put on a ration with steamed bone meal and alfalfa hay added, they showed a gradual improvement in weight, appetite and condition. In the appended table note change in respiration and mucous membranes after phosphorus was added to the diet. This would indicate the diet was deficient in phosphorus and calcium. They came in heat, and conceived at the first service. A peculiarity of even the mildest phos-

phorus deficiency is a decrease in the appetite and loss in production.

The classic work of Theiler and du Toit in South Africa and of Schmidt and others in the Rio Grande Valley, with the confirmatory results of investigations by Eckles in Minnesota and Hadley in Wisconsin, leave no question as to the fact that cattle suffer from calcium and phosphorus deficiencies, or that this occurs over extensive areas of the earth's surface.

J. L. George, K. S. C., '32.
Manhattan, Kansas.

AMPUTATION OF FORE LEG OF A COW

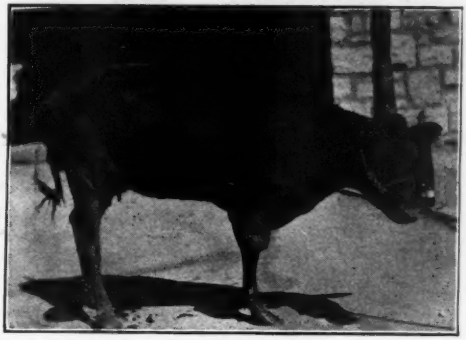
A GRADE cow was presented at the veterinary clinic of the Kansas State College with a history of having received a wire cut about two weeks previously on the lateral aspect of the metacarpophalangeal joint. The animal was severely lame, in intense pain, and refused to place weight on the leg. Examination of the area

Amputation is a practical operation in large animals as well as in pets

revealed that infection and screw-worm larvae had penetrated the joint cavity and that any attempt at local treatment was impractical. It was decided to amputate the leg so that the animal could be fed out for slaughter.

The animal was confined on the operating table in lateral recumbency. The operative area at the junction of the upper and middle thirds of the radius was shaved and tincture of iodine applied to the skin. The skin at the site of the proposed incision was anesthetized with a 1% solution of procaine. A 2% solution of procaine was injected into the muscles and also at a number of points around the radius at the site of proposed amputation.

Two elliptical incisions, one on the medial and one on the lateral side of the leg, were made through the skin down to the muscle.



Ten days after the operation

The incisions through the muscles were a little shorter but similar to the skin incisions. The object of this procedure is to reduce the amount of muscle, to allow room for swelling after the operation. There is apt to be considerable post-operative swelling and if this is not done, suture necrosis and rupture of the skin sutures is prone to occur.

Hemorrhage was controlled with hemostats and ligation of the larger blood vessels.

The soft structures were dissected away from the bone upwards for a distance of about four inches. The bone was removed at this point by means of a bone saw.

The ends of the muscles were then sutured together with a continuous suture of No. 4 chromic catgut so as to form a pad of muscle over the end of the bone. The edges of the skin flaps were united by means of two continuous sutures of No. 16 braided silk. One starting at each end of the incision and coming down to the lower side of the wound where an opening about one inch in length was left for drainage.

A dressing of flexible collodion was placed over the entire area.

The after treatment consisted in keeping the opening free of exudate and the removal of any pieces of necrotic tissue.

On the average these cases require about two weeks to heal properly. This particular case was progressing satisfactorily at the end of ten days, and was sent home.

While amputation of the leg is not always

a practical operation in large animals, its possibilities should not be overlooked, in the case of a valuable breeding animal, or where it will enable the animal to be fed out for food purposes.

G. F. Cotterell,
Manhattan, Kan. K.S.C., '32.

PROTOZOAN LIKE BODY IN BLOOD OF SWINE

There is being forwarded by express a pig that typifies a malady that has been observed in several herds since October, 1931. The malady occurs in suckling pigs about eight weeks of age. The surroundings are good and the pigs are well fed. Those autopsied have had no worms. None of the affected herds have been vaccinated.

Any information you can give me will be appreciated.—H. C. W., Illinois.

Reply: Examination of the carcass revealed the following:

Scurvy condition of the skin in the facial region, unthriftiness and emaciation.

Postmortem examination revealed a general icterus; blood thin and very light in color, and some hemorrhages in lung, heart and kidneys. The spleen was tumefield and dark in color; the liver engorged and yellow.

Laboratory tests: Microscopic and cultural tests for bacteria all were negative. Examination of the blood revealed variation in size of red blood cells and the presence in several of the cells of a spherical body that resembled anaplasma, the causative agent of anaplasmosis in cattle. The white blood cells were apparently normal.

Diagnosis: General icterus and splenic engorgement are relatively common in suipestifer septicemia, but in such cases there is no difficulty in isolating the *B. suipestifer*. The general anemia is a relatively common symptom of parasitism, but no parasites were found.

This cow's left hind leg was amputated while she was carrying the calf shown. The calf was later sold for $30.00. The cow did well and the next year raised another calf equally thrifty.

Pig anemia is a common malady in those pigs that are kept on other than dirt floors in the winter or early spring. These pigs were running in lots and had ample sunshine, facts that eliminate pig anemia.

The finding of a protozoan like body in the red blood cells suggests the possibility of a protozoan parasite. There has been no report of such a disease in this country.

Treatment, without knowing the specific cause, is problematic. Arsenic in the form of sodium cacodylate injected intravenously or Fowler's solution per os, may be of value.

An inquiry similar to the above was received from an Iowa veterinarian, but in the latter inquiry, shotes weighing about 75 pounds were affected. The symptoms, lesions and laboratory findings were the same in both instances.—A. T. K.

Empyema of the Maxillary Sinus in Cattle

By W. S. HORNSBY, JR., Manhattan, Kansas
Kansas State College, Class of 1932

History—Forty head of purebred Hereford heifers were purchased in western Kansas and shipped to the eastern part of the state. These cattle had been dehorned one month previous to purchase. They were divided into two groups of twenty each, and progressed normally for a year.

A year after purchase, six animals of one group developed a marked dyspnea, and were immediately shipped for slaughter. None of the remaining animals of this group became so affected.

One year later—two years after purchase—one animal of the second group was presented at the veterinary clinic of the Kansas State College for examination. Two weeks previously, one animal in this group had been found dead. It was examined and an enlargement of the maxillary sinus found. The trouble was determined to be a primary infection of the sinus followed by purulent pneumonia and septicemia, resulting in death. Before death this animal had had difficulty in breathing.

In the case presented at the clinic, it was clear that there was involvement of the maxillary sinus.

Description of the Maxillary Sinus—The floor of the cavity is irregular and the roots of the last three or four upper cheek teeth project into it, being covered by a plate of bone. The sinus communicates with the palatine sinus freely over the infraorbital canal through an oval opening about two or three inches long. Above this it communicates by a shorter and much narrower opening with the middle meatus nasi.

As mentioned above, the maxillary and palatine sinuses communicate to such an extent that the palatine sinus is sometimes considered part of the maxillary sinus. The dorsal bony roof of the palatine fossa has a large defect in it which is closed by two layers of mucous membrane. Thus, when the maxillary sinus and the palatine fossa become infected and pus gathers in them the mucous membrane of the palatine fossa is distended and protrudes into the nasal air passage causing a stenosis of the air passage, resulting in dyspnea.

The dorsal boundary of the maxillary sinus corresponds to a line drawn from the infraorbital foramen to the medial canthus of the eye; anteriorly to a line drawn from the infraorbital foramen to the facial tuberosity; thence upperward and backward through a large opening into a cavity formed by the lacrimal, frontal, ethmoid and turbinate bones at the medial side of the orbit.

Symptoms—The heifer presented to the clinic was in good condition, the appetite had been normal up until two days before. A very pronounced dyspnea had developed in the last four days before examination at the clinic.

There was a definite bulging of the maxillary sinus anterior to the medial canthus of the right eye. The right side of the poll was lower than the left side, indicating a very close dehorning operation.

Examination of the nasal cavity, oral cavity, and larynx revealed no pathological condition. Percussion over the swollen area gave a dull sound, indicating that a solid or fluid substance was contained therein.

Diagnosis—Empyema of maxillary sinus, probably a result of dehorning.

Treatment—The operative area was shaved, painted with tincture of iodine, and anesthetized by subcutaneous infiltration with 5cc of a 2% solution of procaine hydrochloride. A trephine opening was made at the lowest angle of the maxillary sinus (see illustration) which is practically on a level

with and just posterior to the facial tuberosity. A large amount of thick white pus was drained from the opening and the sinuses were flushed thoroughly with a 2% solution of Therapogen. The head was then tilted to one side—trephine opening down—and continued shaking of the head and flushing removed much more pus.

A tampon impregnated with powdered iodoform and boric acid (1 to 4) was

Empyema of the Maxillary Sinus the fourth day after the operation

packed tightly in the trephine opening to prevent its closing.

The dyspnea disappeared immediately following the operation.

After Treatment—The sinuses were flushed with a 2% solution of Therapogen, a 0.5% solution of potassium permanganate and acriflavine solution 1-1000, using one antiseptic each day. The tampon was changed daily.

The fourth day following the operation, the secretion of pus had subsided to such a degree that the tampon was not replaced. The daily flushing of the sinuses was continued until the sixth day after the operation. When the animal was released to the owner, it apparently was normal except for the operative wound, which was healing rapidly.

Bacteriological examination of the pus in this case revealed that the infection was due to *Actinomyces bovis*.

FEEDING DISTURBANCES IN CATTLE

A telephone call was received at the veterinary clinic at the Kansas State College from a ranch five miles from Manhattan. On arriving at the ranch, it was found that in a herd of 78 Hereford, yearling steers, eight were ailing.

The steers were all raised on the ranch and had been receiving shelled corn, alfalfa, and ground oats as their daily ration. Three of the sickest, one of which was unable to rise, were isolated in a box stall. These calves had been well, apparently, until the day before we visited the ranch.

The calf that was down, was given 500cc of a 5 per cent solution of sodium bicarbonate. It was injected intravenously and intraperitonealy. One and one-half hours later, it died. The following day another one of three isolated steers died. It had not been treated. Two days later, the third died; it too received no treatment. All three died in the same manner, being down about the same length of time and exhibiting identical clinical symptoms.

Postmortem Examination.—The carcasses of all three of these steers that died were brought in to the clinic and autopsied soon after death. As the autopsy findings were very similar in all three, they will be discussed together.

The lungs were found to be congested, having a slight pneumonia, but varied in degree in the three animals. The large and small intestine in all were very nearly empty, but showed no congestion or hemorrhages. The rumen was filled to capacity with food, and the walls had very little tone or elasticity; indicative of atony of the rumen.

The kidneys in two of the cases were normal; in the other one kidney showed a slight congestion. The bladders in all three were filled with a bloody-colored urine which upon examination was found to be a hemoturia and not a hemoglobinuria. The gall bladders were enlarged, inflamed and filled with bile, which was thick and dark in color. All of the fatty tissues were of a deep yellow color; evidencing a marked icterus. The livers in all cases were darker in color

than normal; they had a gritty feel, and showed a degeneration almost to necrosis. Bile, mixed with mucous, could be seen throughout the liver. The gall ducts were congested and inflamed—a catarrhal inflammation. No other organs showed any pathological changes.

Diagnosis.—The cause of the disturbance appeared to be in the food or in the method of feeding. As the rumen was filled and the intestines were empty, it showed that the rumen had not functioned as it should and had not moved the food down into the intestines.

Treatment.—Because of the postmortem findings, a reduction in the amount of feed was prescribed, and feeding at more regular intervals. This plan was carried out by the feeder and there were no further losses.

Several ranchers in this section have had trouble in their feeder cattle similar to this. The losses usually stop after the herdsmen reduce the feed, change the feed, or feed at more regular intervals.

Ben. H. Dean,
Manhattan, Kansas. K. S. C., '32.

COCCIDIOSIS IN CATTLE

The case described in the following was seen while on an ambulatory call from the veterinary clinic of the Kansas State College.

On reaching the farm, we found the sick animal confined in the barn. The history of the case was:

Two months previously the farmer had bought 180 whitefaced, feeder steer calves, weighing about 400 pounds each. He had been feeding these a ration consisting of ground corn, oil meal and alfalfa hay. The feeding yards were very wet and muddy, so the farmer had turned the steers into a small adjoining pasture where they remained except at feeding.

It was the failure of one of the animals to come up to feed that first caused the owner to think that something might be wrong. He drove the ailing animal into the barn and in so doing, noticed that it was extremely weak and passed thin, bloody feces. He called Doctor Frick at the clinic immediately.

The animal showed marked anemia, a profuse bloody diarrhea, temperature 103.3 deg. F. The heart beat was weak and irregular. The animal was unable to rise and had an occasional tonic spasm. It was very wet, and covered with mud.

A tentative diagnosis of coccidiosis was made, and a sample of feces taken for laboratory examination.

The steer was treated by giving 30 cc. of a 20 per cent calcium chloride solution intravenously to relieve the muscular spasms; 20 cc. camphorated oil intramuscularly for a heart stimulant, and about two gallons of warm milk with one ounce of methyl salicylate per os.

The rest of the animals in the feed lot were examined but no further evidence of anything wrong could be detected. The owner was advised to watch the animals closely for further trouble.

A miscroscopic examination of the feces showed large numbers of the *Coccidium zurni.*

Four days later the owner reported that the first steer had died, the night following our visit, and that sixteen of the remaining animals had diarrhea with blood streaked discharges. He was advised to isolate the affected animals immediately, and was given a mixture of equal parts of tannic acid and salicylic acid with instructions to give to each animal showing moderate diarrhea, one ounce daily in the feed. For those showing profuse diarrhea, he was to give one pint of carron oil with one-half ounce of methyl salicylic acid per os.

These affected steers all made a very rapid recovery and there was no further loss, nor has there been a subsequent case of coccidiosis in this herd.

This was a typical outbreak of coccidiosis. It generally happens that the first one or two animals to sicken, die in spite of the treatment and the other affected animals usually recover if they are treated as the symptoms present themselves.

Howard I. Thaller,
Manhattan, Kansas. K. S. C., '32.

Calcium Therapy in Veterinary Medicine

By L. E. BOLEY, Manhattan Kansas
Kansas State College, Class of 1932

CALCIUM, in its various forms, has many uses in veterinary medicine. It is an important factor in nutrition. It is necessary for the structure of the bones and teeth; for the regulation of the muscles, nerves and glands and for the coagulation of the blood. Rickets and osteomalacia were at one time held to be due to a lack of calcium in the ration, but it is now known that they are due also to a lack of calcium assimilation caused by vitamin deficiency. There are many conditions in which there appears to be a true hypocalcemia, such as tetany in mares, parturient paresis of cows, certain cases of pregnancy in growing animals, lambing sickness, eclampsia in bitches, paralysis in swine, trembling followed by convulsions in pigs, etc.

The lack of calcium tends to favor or increase inflammation. For example a calcium salt injected subcutaneously or intravenously will prevent reaction from the application of oil of mustard. Normal dogs are resistant to the experimental production of moist eczema, but if calcium in the circulation be precipitated by injections of oxalates, the resistance is reduced. The above phenomena are believed to be due to a lessened permeability of the blood vessels when the calcium level of the blood is high, and has led to the suggestion that the calcium salts may be valuable in the treatment of moist eczema and mange, and to prevent rashes (anaphylaxis) following the use of serum.

In general, all nervous and muscular tissues function best with a certain optimum concentration of calcium and the function is disturbed by an increase or decrease. A slight decrease of calcium causes a slight increase in the irritability and decrease in strength in all neuro-muscular tissues. As the amount of calcium in the blood approaches zero, the irritability is again lost and complete paralysis occurs. A slight decrease in calcium in muscles leads to spontaneous fibrillary jerking and, in intact animals, to tissue hyperesthesia and convulsions. Death finally comes from paralysis. These effects and tetany of the muscles may be removed by restoring calcium to the animal's body either subcutaneously or intravenously.

Parturient Paresis

Parturient paresis (milk-fever) in cows is a disease which occurs commonly at or near the termination of parturition. Its actual cause is unknown, but the condition is one of hypocalcemia. It has been definitely proved that artificially produced hypoglycemia is not analous to milk-fever, and that artificially produced hypocalcemia is similar to milk fever (Petersen, Boyd, Hewitt, Brown). The administration of calcium intravenously or subcutaneously results in a rapid recovery from milk fever.

The administration of calcium chloride requires care and skill. Calcium chloride in 10 to 20% solutions must be given intravenously. If not carefully administered, varying amounts of the solution

This animal was up four hours after receiving Calcium Gluconate.—Photo by E. T. Baker

will be deposited in the tissues which may result in edema, abscessation, phlebitis and necrosis. Calcium gluconate in 5 to 10% solution is practically non-irritating and may be administered either subcutaneously or intravenously. The cost of calcium gluconate is materially higher than the cost of the chloride.

A typical case of milk fever.

Deficiency Tetany in the Horse

This condition is seen in mares particularly, with foal at foot. It has been shown recently that it is due to an acute calcium deficiency (Montgomery, Savage and Dodds). The clinical picture of such a case is: Bathed in perspiration, can move only with great difficulty and uncertainty; antagonistic muscles often appear to contract simultaneously and coordination is partially lost; general appearance suggests the rocking-horse-like attitude seen in tetanus.

The treatment of this condition is to give calcium chloride intravenously in doses of 250 to 400cc. This condition is seen frequently in England.

Lambing Sickness

Lambing-sickness is due to an acute calcium deficiency, and it has the same single pathological entity as has milk fever (Greig). Lambing-sickness and milk-fever are similar in their time relationship to parturition, although lambing sickness not infrequently appears shortly before lambing, and is also commonly encountered in ewes with young lambs at foot. The clinical symptoms of lambing sickness and milk fever in the cow present much similarity. It should not be confused with pregnancy disease of ewes, the so-called acidosis of pregnancy.

The treatment for lambing sickness is the intravenous injection of calcium chloride in dosage from 50 to 100cc. This condition, like tetany in mares, also occurs more commonly in England than in the United States. Since intravenous medication in the ewe offers more difficulty than in the horse, Greig recommends the use of calcium gluconate which may be given subcutaneously.

Eclampsia of Bitches

Several cases of eclampsia in the bitch have been treated by the calcium therapy method at the veterinary clinic of the Kansas State College. The animals showed typical clonic spasms, and they were given calcium chloride intravenously with good results. The dosage of

Loin disease, the primary cause of which is a calcium (or phosphorus) deficiency

the 20% calcium chloride, intravenously, ranges from 5cc for a 20-lb. dog to 10cc for a 40-lb. dog (Frick). Retching was manifested in the animals for a few minutes after the injection, but the animals have recovered with no ill effects. Again the milder calcium gluconate solution should be used if one has any qualms about his intravenous technic in the dog.

Carbon Tetrachloride Poisoning

Some fatalities have been reported from the use of carbon tetrachloride as a parasiticide in animals. Hall pointed out that animals to be treated with carbon tetrachloride should be put on a diet, rich in assimilable calcium, for at least a week

before treatment. Failing this, calcium chloride should be administered intravenously in cases of intoxication, or calcium gluconate may be given subcutaneously.

Wheat Poisoning

This is a condition seen in animals that are pastured on green wheat during the fall of the year. Some practitioners think the condition is due to overloading the digestive tract with the green wheat. Others believe the condition is caused by a lack of mineral in the young wheat plant. Equal parts of wood ashes, steamed bone meal, calcium chloride and calcium carbonate is a good mineral mixture supplement to be fed as a prophylactic measure in these cases.

Several practitioners have reported good results in treating this condition by the intravenous injection of calcium chloride in dosages from 125cc to 250cc.

Ascites

Ascites is a condition characterized by an accumulation of fluid in the peritoneal cavity without the presence of inflammation. It is secondary to such conditions

Phosphorus is a limiting factor in the growth of cattle. These animals were of the same age and received the same care. All were fed a diet deficient in phosphorus. Nos. 518 and 502 received, in addition, bone meal. Including wheat bran in the ration had the same effect as bone meal

as cardiac insufficiency and obstruction to the portal circulation. These conditions result in a damming back of the blood in the vessels and an exudation of serum through the weakened blood vessel walls. A decrease of calcium in the blood is believed to increase the permeability of the blood vessels. If this be true it appears that the administration of calcium might be beneficial in the treatment of certain cases of ascites. The daily dose of calcium chloride per os for the dog is 10 to 15 grams. The daily dose of calcium chloride per os for bovine is one-half to one ounce.

Lead Poisoning

Lead poisoning has been successfully treated in human medicine by the use of calcium. It has been found that the

Much of the paraplegia in hogs is due to calcium deficiency

quantity of lead excreted may be varied by changing the metabolism of calcium; a positive calcium balance favors storage of lead in the bones, and a negative balance tends to increase its secretion. When acute symptoms are evident it is considered wise to immobilize the lead and impede its liberation from the bones. Cases of lead poisoning in the human are treated by giving the patient a diet rich in calcium. When treated this way, the colic subsides rapidly. Cathartics and atropine are given in addition and the patients are relieved within 48 hours. Lead colic apparently can be relieved quickly by intravenous injections of calcium chloride (15cc of a 5% solution).—Proc., Staff Meeting, Mayo Clinic.

It is apparent from this that the use of calcium either in the diet or intravenously would be of benefit in case of lead poisoning in animals. Very few case reports have been recorded where calcium has been used in the treatment of lead

poisoning in veterinary medicine.

Calcium, while by no means a panacea, has a place in combatting a rather extensive group of ailments of animals. Its use should not be neglected by the practitioner.

MALIGNANT TUMOR FORMATION IN THE DOG

A three - and - a - half - year - old, male, springer spaniel was presented to the veterinary clinic of the Kansas State College, with the history of retching, anorexia and gradual emaciation over a period of three weeks previous to time of observance.

The clinical picture was one of extreme emaciation, eyes sunkn into their sockets, the head hung low, a rough dry coat, and spells of retching at intervals of one or two minutes. The owner advised us that it was almost impossible for the dog to take food—regurgitation nearly always following the attempt.

X-ray pictures were presented by the owner, a physician, and his veterinarian, but they were of little value in diagnosing the case, as they were indistinct and showed nothing that could lead to a positive diagnosis.

Due to the chronicity of the case and the absence of external or pathognomic symptoms an exploratory laparotomy was decided upon and performed immediately.

The animal was placed on the operating table in dorsal recumbency and securely tied. The area of operation, the region posterior of the zyphoid cartilage, was shaved, and disinfected with a solution of tincture of iodine. The site of the skin incision was infiltrated with a 2 per cent sterile solution of procaine; general anesthesia being decided against because of the extremely weakened condition of the patient.

The incision was made directly over the stomach and the area explored by the operator's finger. A small hard swelling was felt on the medial surface of the last rib. On palpitation of the stomach the dog immediately started to retch and that organ filled with air. When brought to the outside for closer examination it filled with air to the extent that the operator made a small gastrotomy to prevent a possible rupture. A few feet of intestine were brought out of the abdominal cavity and examined.

Nothing of diagnostic importance was found, so the stomach and intestine were replaced and further exploration with the finger resorted to. A large solid mass of tissue was felt at the cardiac portion of the stomach and extending along the esophagus to the hiatus esophagus.

The owner was advised that the case was hopeless and the animal was immediately destroyed.

On postmortem examination, it was found that there were malignant growths throughout the thoracic and abdominal cavities. The thoracic cavity was involved to the greater extent; there being hundreds of neoplasms varying from pea size to that of a hen's egg. The growths involved the lungs, pleura, esophagus and peritoneum. The largest of the growths was the one found adjacent to the abdominal portion of the esophagus. A second large growth was found along the thoracic portion of this organ, and in the mediastinum. It was decided that these growths along the esophagus were responsible for the inability to swallow and the constant retching. When opened, the stomach was empty and there was no inflammation present.

An unusual condition was found in the mesentery where the nerves stood out quite prominently and were chalk white rather than the usual yellowish-white. This abnormality was ascribed to the emaciation and consequent lack of normal fat around the nerve trunks.

Sections of these neoplasms were examined microscopically and they were thus determined to be malignant carcimomata.

Daylis L. Berry.
Manhattan, Kas. K. S. C., '32.

A Study of Commercial Dog Foods

By J. W. PATTON, East Lansing, Michigan

THE writer and associates have been interested in a study of commercial dog foods for several years. Our original efforts were confined to clarification of the age-old question as to the ability of dogs to utilize starch. We could see no physiological reason why dogs should not be able to digest starch. However, in the absence of scientific proof and because of the importance of the subject it was necessary that we establish the facts. The dog is an efficient converter of starch, even of raw, laundry starch. This we have demonstrated to our own satisfaction.[1, 2]

In the course of these studies we had observed that commercial dog foods varied considerably in their nitrogenous constituents. This led the writer to a study of what was being offered in commercial dog foods. It is pertinent to recall the rapid increase in our knowledge of animal nutrition during the past twenty years. Information on this important subject continues to accumulate at a rapid rate and has a decided bearing on the prevention and cure of disease.

Chemically Balanced Rations

Early in the last century chemists had established the fact that heat and muscular energy have their origin in a process of oxidation. By the middle of the century it was established that we could classify the energy producing foods into protein, carbohydrates and fats. By the end of the century the energy values of foodstuffs and animal requirements were fairly well known and the calorie was accepted as a measure of nutrition.

We now know that to consider fuel value and repair of tissue as the only important aspect of nutrition is insufficient. We now stress quality above quantity. It was found that a ration 100% efficient from the chemist's viewpoint—might be far from efficient—when fed to animals; might be inadequate even for growth, reproduction or maintenance of the animal. A new field was ushered in with the discovery of vitamins and accessory food factors. We now appreciate that a diet may be sufficient in protein, carbohydrates and fats, yet inadequate in vital organic constituents. This difference, so slight as not to be discernible to the naked eye or by chemical analysis may mean the difference between life and death. The adequacy or inadequacy of a diet is now measured by the state of health, absence of symptoms of disease, growth and reproduction.

It is hardly necessary to recall the work done on the deficiency diseases. It is well, however, to remember that when symptoms of deficiency appear in a group of animals the number showing gross symptoms are few compared to those showing minor effects of deficiency. It has been established that animals on a deficient diet show a greater susceptibility to infectious disease than those maintained on a well-balanced diet. Epithelioma in fowls, xeropthalmia in rats on a diet deficient in vitamine A, and the high mortality, from respiratory diseases, of animals fed on a diet lacking in the fat soluble vitamines are well-established examples of this fact.

Work is progressing along the following important lines related to nutritional deficiency: (1) The chemistry of the blood; (2) the pathogenicity of the bacterial flora of respiratory, intestinal tract and in other areas of the body; (3) the effects of diet on immunological reactions. Progress has been made in elucidating the significance of inorganic blood changes, the relation of alkaline reserve and resistance to infection and to immunological relations. It is hoped that when we are able to correlate the different factors associated with deficient diet that we will be able to exert the maximal influences for correction.

Many interesting experiments have been made showing the influence of diet on the well being of man and animals. Those of McCarrison[3] at Coonoor, India, furnish interesting evidence of the effects of a faulty diet. Thousands of white rats were paired in roomy cages conducive to healthy living and fruitful reproduction. The rats were fed on diets similar to those of the peoples of India. One group was fed on a diet consisting of whole wheat, unleavened bread, butter, legumes, fresh carrots, a small portion of raw meat with bone once a week and an abundance of water at all times. For two and one-half years there was no trace of illness—no mortality, adult or infant, from natural causes. Microscopic examination at autopsy of 1189 rats so fed failed to show any abnormal condition. It is interesting to note that this is the diet of Northern India, where some of the finest specimens of physical manhood are found.

Another group was fed a diet deficient in certain basic requirements, similar to the ration of other groups of natives, and a high mortality prevailed among both the young and the adult. Postmortem examinations on 2243 rats showed lesions of many forms of disease, such as infections of the lungs, blood, glands, skin, heart, nervous, urinary and endocrine systems.

McCarrison concludes from these experiments that diets rich in cereals and poor in animal fat, milk and fresh vegetables are associated in albino rats with a large group of ailments common to man.

Vitamines

Vitamines are the most important discovery of nutritional research during the past thirty years. After 18 years of study, we don't know whether they are substances or properties. Only two have been prepared—carotin, vitamine A, from carrots and green vegetables, and irradiated ergosterol, vitamine D. We know, however, that they are of vital necessity. Our attention has been called to indiscriminate commercial exploitation of these substances especially of vitamine D. Misgivings have been aroused in many minds over its uncontroled use in children. The potency of irradiated ergosterol is remarkable—daily doses of 0.0001mg will cure rickets in a rat in ten days. Daily doses of 1mg will kill a rat in three weeks.

Interesting experiments in human medicine to determine the effects of vitamine deficiencies in the diet on the teeth are of great importance to veterinarians. Mellenby (4) reports deal with puppies fed a diet deficient in vitamines A and D. A diet deficient in vitamine A leads to hyperplasia of the subgingival epithelium and to its invasion by pathogenic bacteria. A diet lacking in vitamine D leads to a deficiency in alveolar bone and irregularities in dentine. This lack of vitamine A and D in a puppy's diet leads to periodontal disease at a later stage, regardless of the subsequent diet; whereas a balanced diet during the developmental stages prevents or inhibits this disease at a later stage even if the subsequent diet is lacking in vitamines A and D. The normal development of the hard structures of the teeth is dependent on an adequate supply of vitamine D, whereas the normal development of the periodontol tissues is equally dependent on an adequate supply of vitamine A. The function of A, so far as is known, is to maintain the functional integrity of the cells covering the body surface, thereby preventing the successful invasion of microbian organisms. Space will not permit us to go to further detail regarding the necessity of an adequate diet.

Commercial Dog Foods

When a study is made of the commercial dog-food situation, we are impressed with its possibilities, astounded by its magnitude and deplore its present unsettled and unsatisfactory condition. As guardians of the health of all animals, veterinarians have neglected to give the importance of adequate diet anything like the attention it deserves. Together

with the layman we have stubbornly held to fallacies and superstitions bereft of common judgment. The question: "What shall I feed my dog" would bring forth an astounding array of opinions. We have permitted others to take from us the solution of the important problem of diet, when by training and experience we should be in sound position to advise in the matter.

Much depends upon our point of view as to what to expect from a commercial food. Is it just something to eat, or is it, in every sense of the word, a balanced ration or food? Most of the dog foods, both canned and dry, make the latter claim. How near these claims are being met, in the dog foods now on the market, is for you to judge. In all probability prepared dog foods are here to stay. We can at least dream of their being a perfect balance of digestible nutrients and vital constituents in convenient form and at reasonable cost for every dog use. The facts are, not all products for feeding dogs offered for sale are worthy of our support. Time, no doubt, will eliminate many of the unworthy. In the meantime, we should give their analysis, their known content of vital constituents, serious thought before recommending them to others or using them ourselves. The product is no better than the ability and responsibility of the producer. Judged in the light of our present knowledge of balanced rations for dogs, pets and foxes, their preparation is no easy undertaking.

Canned Foods and Biscuits

It is difficult to ascertain the exact ingredients of commercial dog foods.

Some of the most common ingredients are:

1. *Meat.*—The source of animal protein may be horse meat, beef or pork, either desiccated or frozen; beef-scrap, beef and bone meal, tankage, lard renderings or crisp, bloodmeal, livel meal or fish meal.

2. *Cereals.*—The common cereals and their by-products are used. Whole wheat, barley and rice. Wheat bran, low-grade flours (one or two may use high-grade clear or patent), middlings, red-dog, glutens, germ, cornmeal, grits, oatmeal, oat flour, ground oats, groats, soy beans.

3. *Milk.*—Usually powdered sweet or butter milk.

4. *Vitamines.*—Some manufacturers make no mention of any, others include in their claim A, B, D, E, and G, and will doubtless add others to their claims when they hear of them.

5. *Minerals.*—Most manufacturers rely upon the normal minerals of the ingredients, others add minerals—chiefly calcium and sodium chloride.

6. *Miscellaneous Ingredients.*—Egg yolk, yeast, molasses, malt syrup, beets, alfalfa meal, spinach.

Cereal Rations

Several cereal rations are procurable. These, for the most part, are products of breakfast food manufacturers. They are rejects, or products for any of several reasons, unsuited for package goods. This in no way interferes with their use in a dog food. Most of these products have had considerable experimentation and in many respects are worthy of our consideration. Some of these cereal foods are marketed as obtained, others are fortified with animal protein (fresh beef, beef scrap or lard renderings) and in some instances, with vitamines and minerals.

There is considerable variation in the manner in which dog foods are prepared. Some are the result of a very technical process. Such is the case in the product from human food establishments. Others are prepared by the relatively simple process of a dry mash cooked and compressed. It may be baked as in the biscuit. In canned food, a thick stock may be made of meat and cereals, gelatin may or may not be added, then canned. Or, the ingredients may be put into cans, then cooked by steam. A biscuit may be as hard as flint or so soft as to be crumbly, leavened or unleavened. The palatability, digestibility and adaptability of a good many may be as variable as their balance, composition or analysis.

Varying Analyses

A study of the accompanying tables show a wide variation in chemical analysis of different brands of commercial dog food. In the light of our present knowledge those of reasonable analysis and composition are outnumbered by those of empirical formulae. Ingredients of questionable value in a dog food are included in many. Many of the claims are unsupported by scientific facts. It is questionable if such a thing as a balanced ration, or food, for the dog, cat or fox, is procurable. Certainly it is most difficult to balance for all these animals in a single product; prevailing claims to the contrary notwithstanding. The burden of proof rests with those making the claim. Upon them rest the obligation to support their claims by the publication of scientific experimental evidence. The day is past when the quality of a remedy or of a food can be proved to thinking people by testimonials of users. We are entitled to more from this industry than is to be had from the old time manufacturers of patent medicines. Nutrition is a science and we want scientific data, not the results of a guessing contest or a contest at making claims.

Growth of Dog Food Industry

A survey of commercial dog foods reveals some interesting information along other lines. Up until a few years ago, it was necessary only to produce something a dog would eat. As competition became greater, "balanced food" became meaningless words to many in order to meet competition. The field branched out to include cat and fox food, yet the "balance" remained the same. Packers of meat products for human consumption found in animal food a ready market for unsalable products. The milling industry entered the field with cereal products.

Formulae and chemical analyses are guarded secrets with some because they believe they possess "the secret" and with others not so sure that they know what it is all about. Otherwise responsible concerns who appreciate analysis and balance, have their dog food products made for them by producers not interested or ignorant of analysis or nutritional standards, especially for dogs. As competition becomes still keener, price became a determining factor, until today we have a situation deplorable to producer and purchaser alike, and let us not forget, to the dog also.

TABLE I (Patton)

*Analysis of 9 Brands Canned Dog Food

Brand	Dry Matter %	Water %	Protein %	Carbohy drates %	Nit. Free Ext. %	Fat %	Fiber %	Ash %	N. R.
1	30.51	69.49	8.49	16.91	15.73	1.25	1.18	3.86	1:2.3
2	21.18	78.82	7.0	12.14	11.69	.41	.45	1.63	1:1.8
3	25.99	74.01	7.28	13.05	12.41	5.13	.64	.53	1:3.4
4	25.19	74.81	7.08	12.39	12.09	5.04	.30	.68	1:3.3
5	30.31	69.69	4.37	20.84	20.49	2.26	.35	2.84	1:5.8
6	29.59	70.41	11.20	13.39	12.98	3.0	.41	2.0	1:1.8
7	26.91	73.09	10.29	11.67	11.39	4.35	.28	.6	1:2.1
8	26.90	73.10	10.30	11.66	11.39	4.36	.28	.6	1:2.1
9[1]	27.60	72.40	5.09	16.22	16.19	3.62	.03	2.40	1:4.8

*Wet Basis. [1]Stated analysis.

The retail cost varies between wide ranges —15c to $3.50 a pound. On a dry matter basis the dry food provides nutrients, or at least calories, far more economically than the canned food.

TABLE II (Patton)

Analysis of 10 Brands Dog Biscuit

Brand	Dry Matter %	Water %	Protein %	Carbo-hydrates %	Nit. Free Ext. %	Fat %	Fiber %	Ash %	N. R.
A	93.5	6.5	20.2	63.4	.....	4.2	.....	.....	1:3.6
B	92.0	8.0	20.0	56.0	50	4.	6.0	6.0	1:3.2
C	90.59	9.41	13.65	57.82	55.41	14.26	2.41	2.45	1:6.6
D	93.25	6.75	42.29	29.10	26.16	8.82	2.94	13.04	1:1.1
E	93.00	7.0	18.0	69.25	67.75	3.25	1.50	2.50	1:4.3
F	93.18	6.82	18.16	69.28	.....	2.27	.....	3.47	1:4.1
G	93.0	7.0	21.0	61.0	58.0	5.0	3.0	3.0	1:3.4
H	94.30	5.7	23.25	62.42	59.87	3.57	2.55	5.06	1:3.0
K	91.53	8.47	21.19	57.62	54.28	1.97	3.34	7.41	1:2.9
L	93.5	6.5	20.2	63.4	.....	4.2	.....	.....	1:3.6

TABLE III (Patton)

Summation of Analyses

	Dry Matter %	Water %	Protein %	Carbo-hydrates %	Fat %	Fiber %	Ash %	N. R.
Biscuit High.....	94.30	9.47	42.29	69.28	14.26	6.0	13.04	1:6.6
Low.....	90.59	5.7	13.65	29.10	1.97	1.5	2.45	1:1.1
Canned* High.....	30.51	78.82	11.20	20.84	5.13	1.18	3.86	1:5.8
Low.....	21.18	69.49	4.37	11.66	.41	.03	.53	1:1.8

*Wet Basis.

TABLE IV (Sutherland-Patton)

Comparison Average Can Dog Food and Ground Beef (Hamburger)

	Dry Matter %	Water %	Protein %	Carbo-hydrates %	Fat %	Fiber %	Ash %	N. R.	Calories
1 Pound Ham-burger	34.5	65.5	20.3	.....	13.6	.....	1.1	1:1.5	950
Contents Av. 1 lb. Can.....	27.85	72.15	7.56	14.79	2.85	.55	1.92	1:2.8	.....

This chain of circumstances has been possible because of the unsettled situation and absence of nutritional facts regarding the requirements of dogs, cats and other small animals. Recently some concerns have been making conscientious efforts to meet the nutritional requirements of dogs.

Great Quantities of Dog Food Used

Something might be said of the enormous quantity of commercial dog foods used. For obvious reasons, definite information on this subject is difficult to obtain. The following information and suppositions are offered simply for consideration and not as accurate data.

It is estimated that there are 10 million licensed dogs in the United States. If we suppose only 10% are regularly fed commercial dog foods we get the following:

Licensed dogs in United States 10,000,000
10% eating commercial foods .. 1,000,000

	Weekly cans—lbs.	Yearly cans—lbs.	Weekly	Yearly
5% of dogs averaging				
3 cans weekly	1,500,000	78,000,000	$150,000	$7,800,000
5% averaging 2 lbs. biscuit weekly	1,000,000	52,000,000	$125,000	$6,500,000

This would mean a yearly consumption of 65,000 tons of food and costing retail at 10 cents per can and 12½ cents per pound for biscuits, more than fourteen million dollars.

In support of these figures we call to your attention the advertised claims of one prominent manufacturer of canned food that "several million cans are shipped monthly." We have been reliably informed this same concern is the largest single user of a "certain size" can in the United States and the second largest user of wheat germ, a product difficult to divert from medicinal channels and obtainable only because of their large purchases of cereals and by-products. Judging from collateral information that we have, these figures seem likely to be greatly underestimated. From reliable sources we are told that there are 59 brands of foods on the market, and it would appear that the number is increasing as is also the use of commercial dog foods. All of this leads us to wonder when we can expect the producer of dog foods to substantiate their claims by authoritative chemical analysis and scientific experimental data. It cannot be long before some see the futility of offering just another can or biscuit. To the honest manufacturer, I would say—if you have the facts their presentation will assist us to sift the chaff from the grain. Neither the profession nor the laity can be expected much longer to pay for the privilege of indulging in dietetic errors for the sake of convenience.

Prospects for Improvement

The possibilities of the present volume of business, if for none other, justifies every effort being made towards this end. The turning point appears to have been reached. No longer will the veterinary profession remain satisfied with past conditions, and the dog owner who constantly seeks advice from the profession may be expected to follow its lead in this matter. It is hoped that producers will concern themselves with nutritional studies as to the various requirements of dogs and other animals, and substantiate their claims with experimental data instead of discrediting them with an air of secrecy.

It is the hope of the writer that a better understanding and more cooperation between the veterinary profession and the dog food producer may obtain in the near future for the benefit of all concerned.

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Canine Filariasis

By H. P. HARTZELL, Manhattan, Kansas
Kansas State College, Class of 1932

FILARIASIS in dogs is of common occurrence throughout China, Japan and to a somewhat lesser degree, it has been observed in Brazil, Australia, East India and also in Europe and North America. The occurrence in the United States is chiefly in the southern tier of states.

The organism responsible for filariasis in dogs is usually the *Dirofilaria immitis*, a small, whitish, filiform nematode, occurring usually as an entangled mass in the right chambers of the heart. However, in some few instances, it has been demonstrated in pulmonary arteries and the vena-cava. The adult male measures from 12 to 18cm. (five to seven inches) in length and 0.7 to 0.9 mm. (1/36 to 1/28 inches) thick. The female, being a bit larger, is about 25 to 30cm. in length and 1 to 1.3mm. in width. The larvae is quite small, having a length of only about one-fourth millimeter and is only about 0.005mm. in width.

The adult female is viviparous; depositing its embryos or larvae directly into the blood stream, in which they circulate freely and may exist for some time. The larvae do not grow to sexual maturity within the body of the dog, but are ingested by mosquitos, feeding upon the affected host. The larvae or microfilariae, while in the intermediate host bore through the intestinal wall into the Malpighian (excretory) tubules where further development takes place. About two weeks are required for such development. The larvae migrate over the body of the mosquito, gaining entrance to the proboscis. Then by penetrating the walls of the proboscis during the biting or feeding process the larvae are deposited in the wound or upon the surface of the skin, and make their way through the subcutaneous tissues into the blood vascular system of the dog and grow to sexual maturity, usually in the heart. After impregnation, the female Dirofilaria deposits its embryos in the blood stream thus completing the life cycle. The adult lives for several years.

Recent investigations have revealed that various species of anopheles, aedes and culex mosquitos may serve as the intermediate hosts of the *Dirofilaria immitis*. It is believed that the common flea of the dog and cat, *Ctenocephalus canis* and *C. felis* respectively, may serve as intermediate hosts, but this has not been proved to the satisfaction of all.

The following case of filariasis occurred in a two-year-old male pointer which along with two other affected dogs, was sent to the clinic at the 68th annual meeting of the A. V. M. A. at Kansas City, (Aug. 1931), by Doctor Marsteller, of College Station, Texas, for the purpose of demonstrating filariasis in dogs at the small animal clinic. Autopsies on two of the dogs, conducted by Doctor Benbrook of Ames, revealed no adult Dirofilaria in the heart; however, the larvae were demonstrated in the blood stream by microscopic examination. Failure to find the adult may be attributed to the method of destruction—the injection of chloroform directly into the heart. The third dog, or the subject in this case, was not killed, but was sent to the veterinary hospital of the Kansas State College for further observation and experimental treatment by Doctor Frick.

The history of this case was that the dog showed signs of weakness in the posterior parts, tiring easily when exerted and that microfilariæ had been demonstrated in its blood. The larvae have been observed also from time to time since the animal arrived at this institution.

The animal when placed under observation was noticeably obese, anemic, and very weak in muscular action. He could walk only about 100 feet without becoming very tired and unsteady in his gait. When urged on he would fall from exhaustion; however, after lying quietly for a few minutes

he was again able to proceed. At all times, he was ready to eat and drink and very alert. The bowels were in excellent condition. The temperature was always normal.

Treatment consisted of placing the patient on a strictly protein diet (raw lean meat) and plenty of water. He was exercised nearly to exhaustion each day for a period of one week. Gradually he began to regain strength. On September 26, an intravenous injection of iron and arsenic 5cc (1 gr. colloidal iron cacodylate) was administered and the patient exercised. The following day he was exercised only. On September 28, another 5cc intravenous injection of iron and arsenic was given; also on September 30, October 2, 3 and 5. Exercise, for about one hour, was given daily. He appeared to be gaining in strength and was somewhat more steady in action. The following week, exercise was the only treatment. On October 12, an intravenous injection of 20cc sodium iodide and sodium salicylate (1 gm. aa) was given; also on the 19th and 21st. He was exercised and observed daily until December 15th, when an intravenous injection of 5cc iron, arsenic and phosphorus (1 gr. colloidal iron cacodylate and 1 gr. sodium glycerophosphate) was given. The injection was repeated the following day. Since that date, daily exercise has been the only treatment.

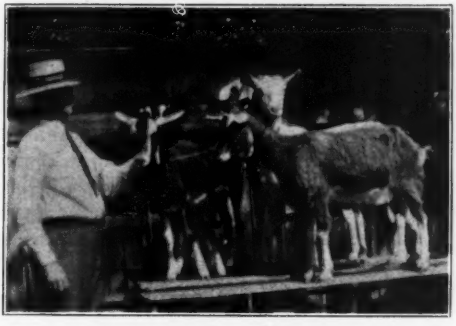
After the first series of injections there was a noticeable decrease of adipose tissue and a marked increase in strength. The patient was always ready to run and play. He continued to gain strength and on several occasions during December was taken quail hunting. The first few trips revealed awkwardness and frequent stumbling, but after a few more trips he could run continuously and seemingly tired but little. His present condition is that of a normal dog in every respect except for the presence of a few larvae which are still to be found in the blood stream.

Microscopic examinations since the treatment began reveal a marked decrease in the number of larvae present. One must search through several fields of the microscope to find even one larva, where formerly three or four could be found in every field.

CHEMO-THERAPY IN BANG'S DISEASE

After reviewing briefly the history of the disease and discussing the usual vaccine and serum therapy in combatting it Dr. R. Dominguez[1] cites Schubert's results of treatments extending over a long period with a solution of trypan blue, properly diluted and administered. These treatments were made during several breeding periods extending over quite a territory. Schubert had used the different vaccine and serum therapies for over 11 years at about 165 establishments without any reassuring results. When the author began to point out the potential dangers of further dissemination and the danger to men and animals from the use of live cultures his thoughts turned to the chemo-therapy and he began using trypan blue. His initial work was done at a place where five head had aborted during the preceding two months. Five more proved infected, showing clinical symptoms. They were treated and no more abortions occurred. 467 cows of which 117 had aborted during one breeding season were treated. Seventeen aborted during the first season after treatment began; during the second breeding season there were no abortions. From 463 animals treated 3.6 per cent aborted; the aborts showing symptoms of rickets.

[1] Aborto Epizootico de las Vacas. Por Dr. R. Dominguez. Enero y Febrero 1931. Núms. 13 y 14. Ano VI.



Harry J. MacCartney, Joplin, Missouri, and three of his milk goats. Doctor MacCartney is convinced that goat's milk is the best of all foods for invalids.

Favorite Prescriptions

By G. F. PATTON, Manhattan, Kansas
Kansas State College, Class of 1932

EVERY practitioner has his own pet prescriptions. The following are a few of those used by the veterinary hospital of the Kansas State College. These prescriptions are used because of the ease with which they can be compounded, their wide variety of uses, the relatively small cost of each, and the practicability with which they can be dispensed to clients and the fact that they have proved through years of usage that they produce the results that are expected of them.

Carrel-Dakin Solution

℞

Calcis Chlorinatae	℥ jss
Acidi Borici	℥ jss
Aquae Destillatae	q. s. Cong. j.

Misce et fiat liquor.

Thoroughly mix the powdered boric acid and chlorinated lime and place on gauze or cotton in a large funnel. Let boiling water pass slowly through the powder (at the rate of a few drops per minute) until one gallon has been used. This makes about a 0.5% solution of hyperchlorate of lime.

Chlorinated lime is a deodorant and a disinfectant. Boric Acid is a weak antiseptic. It is protectant and soothing when applied to raw surfaces or inflamed mucous membrane. The combined action of the two is an antiseptic deodorant, non-irritating to skin and mucous membrane. It is excellent for flushing abscess cavities. It is also used to a great extent in dairies because of its deodorant and germicidal action as a disinfectant for milking utensils. If well diluted it may be used with satisfaction as a uterine douche.

The cost of one gallon of Carrel-Dakin solution so prepared is approximately 5c. It is frequently used as an inexpensive substitute for some of the high-priced dairy antiseptics advertised on the market.

Linimentum Alba

℞

Pulveris Saponis	℥ ij
Olei Terebinthinae	℥ xxjv.
Aquae Ammoniae Fortioris	℥ ij
Ammonii Chloridi	℥ jv
Aquae Destillatae	q. s. ad Cong. j.

Misc et fiat linimentum.

Add the powdered castile soap, the ammonia water and the ammonium chloride to one-half gallon of distilled water in a gallon container. Mix well by shaking for a few minutes. Then add the turpentine and enough water to make one gallon. This compound is of a thick, white consistency and has a strong odor of ammonia. If a milder odor is desired, two to four ounces of a volatile oil (oleum organum) may be added, and to thicken the preparation further add a small amount of castile soap.

White liniment is very useful in the treatment of bruises, sprains, muscular rheumatism and relieves pain in swelling such as collar galls, etc. Its primary use is as any liniment. It should be rubbed well into the parts affected.

The cost of compounding this prescription is about 45c per gallon. It is prepared easily and because of its wide range of usefulness and the ease of application, large quantities may be dispensed with advantage.

"Bipp" Paste

℞

Bismuthi Subnitratis	℥ j
Iodoformi	℥ ij
Petrolati Liquidi	℥ j
Petrolati	℥ j

Misc et fiat unguntum.

Mix the bismuth and iodoform in a mortar with a pestle, then add the mineral oil and vaseline. The amounts of mineral oil and vaseline may be varied depending on the consistency desired.

Gauze may be impregnated with this ointment and applied to a wound, or the oint-

ment may be spread directly upon the wound, or packed into sinuses as a germicide, astringent and emollient.

Bismuth subnitrate coats, protects and has marked healing qualities when applied to inflamed mucous membranes and raw surfaces. Iodoform is easily absorbed from raw surfaces and has excellent germicidal action. It stimulates phagocytosis and lessens secretions rendering the wound a less favorable field for the growth of bacteria.

The value of "bipp" lies in the fact that it slowly liberates iodine. It was used overseas during the war as a wound dressing with excellent results. Gauze impregnated with bipp may be used with advantage to pack wound cavities, fistulous withers, after enucleation of the eye ball, after opening abscesses, hematomas etc., or it may be injected into fistulous tracts with a syringe and allowed to remain *in situ* till absorbed.

The cost of the ingredients in this prescription is $1.38 and though expensive, its value warrants its use in the treatment of serious wounds, particularly suppurating and sinuses and cavities where dependent drainage is difficult to provide.

The name "bipp" results from joining the initial letter of the name of each ingredient.

Liquid bipp is composed of one ounce each of bismuth subnitrate and iodoform and mineral oil to make one pint. It is used in the treatment of the uterus in retained placenta. After the removal of the placenta, a pint of liquid bipp every other day gives very satisfactory results.

Worm Oil

℞

Olei chenopodii	℥ j
Olei terebinthinae	℥ viij
Olei Ricini	q. s. ad Cong. j.

Red coloring matter q. s. to desired color
Misc et fiat solutio.

To remove *Ascaris suum* (roundworms) of pigs, give one ounce to each 50-pound hog. If the pigs are weak and anemic, use equal parts of mineral oil and castor oil instead of straight castor oil.

This anthelmintic is given per os either by passing the stomach tube or with a 2-ounce, metal, dose syringe. Pigs weighing from 30 to 50 pounds should be treated.

The oil American worm seed of course, is the principal ascaricide. The turpentine serves as a carminative antiseptic and anthelmintic. The castor oil in this quantity is a strong laxative and sweeps the killed worms and the oil of chenopodium out of the intestinal tract. The red coloring matter serves to identify the worm oil from castor oil.

The cost is about $5.00 per gallon, or 4c per pig. This preparation is more effective than worm capsules dispensed on the general market.

Distemper Oil

℞

Methylis Salicylatis	℥ ij
Bismuthi Subnitratis	℥ ij
Liquoris Calcii Hydroxidi	Oj
Olei Morrhuae	Oj
Stock Flavine Solution	℥ vj

Misc et fiat solutio.

Sig. Give one ounce twice daily to a dog of medium size.

Mix the lime water and cod-liver oil thoroughly, then add the bismuth subnitrate, using a mortar and pestle to mix. Finally add the oil of wintergreen and the flavine solution. The product will be a thick yellowish white emulsion with an odor of cod-liver oil. The preparation is not permanent. Fresh quantities of it should be made up every two months.

This preparation is useful in the treatment of enteritis occurring in conjunction with canine distemper. The methyl salicylate is a carminative and intestinal antiseptic. The lime water is antacid to the stomach and intestines, and will often relieve the vomiting in gastritis of dogs. The bismuth subnitrate is soothing and has marked healing action when applied to irritated mucous membranes. Cod-liver oil is a food, not a medicine, rich in vitamines A and D. The flavine solution serves as a coloring agent and is antiseptic.

Distemper oil is used in intestinal forms of distemper, enteritis and other intestinal disturbances. Its value lies in the antacid, antiseptic, protective coating it forms over

inflamed mucous membranes and the cod-liver oil, which supplies food and vitamines.

The cost of this prescription is about 65c a quart. It is easily prepared and large quantities may be dispensed at a fair margin of profit.

Pyoktannin Blue

℞

Pyoktannin Blue	℥j
Alcoholis	Oiij
Aquae Destillatae	q. s. ad Cong. j.

Misce et fiat solutio.

Sig. Apply once or twice daily to open wounds and shoulder galls, saddle sores, scratches, etc.

To one ounce of pyoktannin blue (methyl violet) in a gallon container, add three pints of 70% denatured alcohol. Mix thoroughly and add water to make one gallon.

If a more astringent action is desired add more alcohol and less water.

Pyoktannin blue is an astringent antiseptic and is used as the basis for practically all commercial gall cures. It is used on chronic wounds for its penetrating powers. Its staining power is outstanding.

It costs about $2.55 per gallon to compound this prescription, but a very small amount of it is required for an application. Because of its many common uses, it is much in demand among farmers and truckmen for dressing ordinary wounds.

EPILEPTIC SEIZURE IN THE DOG

Hutyra and Marek, in their Pathology and Therapeutics of the Diseases of Domestic Animals, define epilepsy as a chronic illness occurring periodically, manifesting itself by severe derangement of consciousness accompanied by tonic-clonic spasms. The severe epileptic attack manifests itself in the great majority of cases by the following symptoms:

The animal suddenly exhibits great anxiety, stands with a fixed stare and widely dilated pupils as if nailed to the ground. It soon begins to tremble, breathes deeply with maximal opening of the nostrils, reels to and fro, seeks for a time to preserve the equilibrium by straddling, but soon falls unconscious to the ground in convulsions. The attack lasts from a few seconds to one-half hour, generally from one to five minutes. For the recognition of genuine epilepsy, the establishment of the chronicity of the affection appears to be of primary importance in diagnosis, but due weight must be given to whether during the periods between the attack the animal exhibits any organic disease of the brain or other diseased condition which may stand in casual relation.

About six months ago, a four-year-old fawn, male greyhound weighing about 65 pounds entered the veterinary hospital of the Kansas State College with a history of having fits at intervals, especially while racing, or after racing.

Immediately upon entry, the dog was examined for parasites and was found to have hookworms. It was given tetrachlorethelene, 1cc for each ten pounds of body weight.

Later examination showed the dog had been freed of parasites, but it continued to have fits. The fits would start with a staring, anxious expression, going into a tonic-clonic spasm and then collapsing into unconsciousness. These fits would last from one to four or five minutes. The animal was X-rayed and found to be free from foreign bodies, adhesions or any abnormalities.

The dog was given several experimental treatments, one of which was 10cc of calcium chloride intravenously every second day for about a week; another was iron and arsenic—64mg colloidal iron cacodylate. He was given two doses of this preparation intravenously. After this treatment, the dog seemed to be all right for about a month, when it came down again with the tonic-clonic spasms at weekly intervals.

This case was diagnosed as a nervous disorder characterized by epileptiform seizures. We were unable to ascertain the cause even after eliminating the common possibilities of distemper, fright disease, etc.

R. W. Hayes,
Manhattan, Kansas. K. S. C., '32.

Book Reviews

Klauenkrankheiten. (Diseases of the claws of cattle, sheep and swine). By E. Hess and E. Wyssmann. (Vol. 4, Part 3 of Fröhner-Schmidt, Handbook of Veterinary Surgery and Obstetrics.) 3rd edition, Berlin and Vienna, 1931. 255 pp.

From remote antiquity, cattle raising has been an important industry in Switzerland. The innate love of the Swiss farmer for his stock is reflected in the excellent care he bestows upon his dumb charges. Ever since the founding of veterinary colleges in Switzerland, bujatrics, therefore, was kept in a flourishing state by Swiss veterinarians. In consequence the Swiss veterinary schools became renowned centers for the study of cattle diseases throughout Europe. Thus it was natural that the editors of the well known "Handbook of Veterinary Surgery and Obstetrics" should have turned their thoughts toward the Veterinary School at Bern for an author for the volume on the diseases of the hoof of cloven-footed animals to appear in their series of monographs. The book under review was originally written by the late Prof. Dr. Hess, an internationally known authority on cattle diseases. The present edition has been revised and brought down to date by his successor, Dr. E. Wyssmann, Director of the ambulatory Veterinary Clinic of the University of Bern.

The book is divided into eight chapters. The first chapter, written by the celebrated Swiss veterinary anatomist, Prof. Dr. Th. V. Rubeli, deals with the anatomy of the claw. The second chapter discusses the defects of the claws. The third chapter is headed "care of the claws." Chapter four tells of the methods of restraint. Chapter five to eight inclusive describe the diseases of the claws and their treatment with a completeness that leaves no disease problem untouched. An international bibliography and an index complete the volume.

Here is a book, indispensable as a fountain of information, to the cattle practitioner. Indeed no veterinarian who is able to read medical German and who is anxious to increase his knowledge and his usefulness to his clientele can afford to pass this book by. Every sentence in the book is evidence that the authors draw and speak from a vast practical experience in this field. The veterinary profession is indebted to the authors for having increased our knowledge and for having pushed farther back the boundaries of the unknown.

Fritz Volkmar.

Grundlagen einer klinischen Hämatologie der Haustiere. (Outline of clinical hematology of domestic animals), by D. Wirth. Berlin and Vienna, 1931.

One of the gratifying aspects of the present state of veterinary science is the appearance of monographs on timely subjects for the practitioner by distinguished reviewers. Of late, the absence of an up-to-date text on veterinary hematology, comparable to the ones in human medicine, has been keenly felt by veterinary clinicians and research workers the world over. English speaking veterinarians were fortunate in having had access for many years to the pioneer work in this field by Burnett, the second edition of whose work appeared in 1917. Since this time much progress has been made and Prof. Dr. Wirth, now president (Rektor) of the Viennese Veterinary College, has assumed the task to sift the voluminous literature accumulated during the last decade and a half, to correlate and associate all the important advances in hematology and to elaborate them, out of the results of his own investigations and experiences. The outcome of it is the present valuable monograph of 311 pages, which will be welcomed by all veterinarians who have at heart the advancement of veterinary science and their own education.

The book is divided into three parts. The general part comprises 102 pages. After a brief introduction and historical sketch, the technic of blood examination is given in detail, mentioning all the practical tests in use. A short chapter is devoted to the ancestral development of the blood cells.

Of special interest in the book is the

thorough discussion of the leukemias of the domestic animals (34 pages). Of the infectious leukemia of poultry the author says that it is a specific infection caused by a virus. As in mammals it may take the form of a marked hyperplasia of the blood-forming organs. It occurs in poultry only. He says that the lymphatic hyperplasia starts from the lymphatic tissues, present in all organs, since true lymphnodes are absent. In contradiction to Baum and other investigators, Wirth holds that the fowl does not have true lymphnodes, but possesses an extensive system of lymphoid tissue in diffuse connective tissue. He states that the lymphatic hyperplasia originates from these lymphatic tissues. The myelogic hyperplasia develops preferably in the liver and spleen. As a rule it does not reach such a massive extent as the lymphatic hyperplasia.

The author has striven to make the volume practical in its application and he has admirably succeeded. The organization of the material is ideal for the study of hematology. The entire book is interesting and it is evident that the author has presented a scholarly and critical work which should be of real interest to the practitioner and student alike.

Fritz Volkmar.

Manual Teorico-practico con Illustraciones para Herradores y Forjadores. (Theoretical and Practical Handbook for Horseshoers and Blacksmiths, with Illustrations) by Max Maser, Chihuahua, Mexico.

The first part of this little volume written for the horseshoer from the horseshoer's viewpoint is a valuable contribution to the art of horseshoeing inasmuch as it is reduced to the very essentials which have to be mastered necessarily by one interested not only in normal shoeing but also in corrections of anatomical derangements of the extremities due to diseases or injuries sustained by them or their essential parts. The book is written in a clear, concise language and may be understood therefore easily by the artisan. Step by step the art of horseshoeing is explained by plates and photographs from original working models. The first plates and the first chapters deal with the normal anatomy of the foot. Part for part is shown on the plates and being numbered in the like manner on all plates may therefore be viewed from different angles and sides. Effective shoeing methods for both horses (and mules) and for cattle are then explained and illustrated. The author has in many instances explained certain recent German views and practices in shoeing. The most essential and indispensable tools and aids are illustrated and their uses explained and certain common malpractices warned against at the same time. Normal and pathological shoes are illustrated and their uses explained in the text. Several types of shoes to be used in deformed hoofs due to laminitis are illustrated and discussed with the changes necessary in certain intervals and the faulty conformation improves to normal or as near normal as possible. Shoes intended for animals suffering from spavins and tendinitis are shown. The method in such cases is interesting and clearly shows German influence. Shoes for use in cases of ossification of lateral cartilages (sidebones) are illustrated. They are of fine smooth material and finish, as light as possible and with wider shanks. Shoes intended to be used in "corns" are illustrated as are racing plates also. Objectionable shoes and shoes for "paddling" are dealt with. The final chapter is devoted to the harmful practice of inexperienced shoers who rasp the horny walls, thereby destroying the periople.

The extensive and well chosen literature referred to gives the reader an idea as to how much study, experience and practical knowledge was necessary to boil the whole matter down to this small concise volume and still be of value. The little book should lend itself to be supplied to horseshoers lacking certain essentials. The author is a veterinarian and it was written with this end in view. The discussions however are very technical. It is in keeping with the rapid upward trend in rural education reasserting itself everywhere in Mexico today. Veterinarians who read Spanish will find it a useful reference volume.

H. J. Magens.